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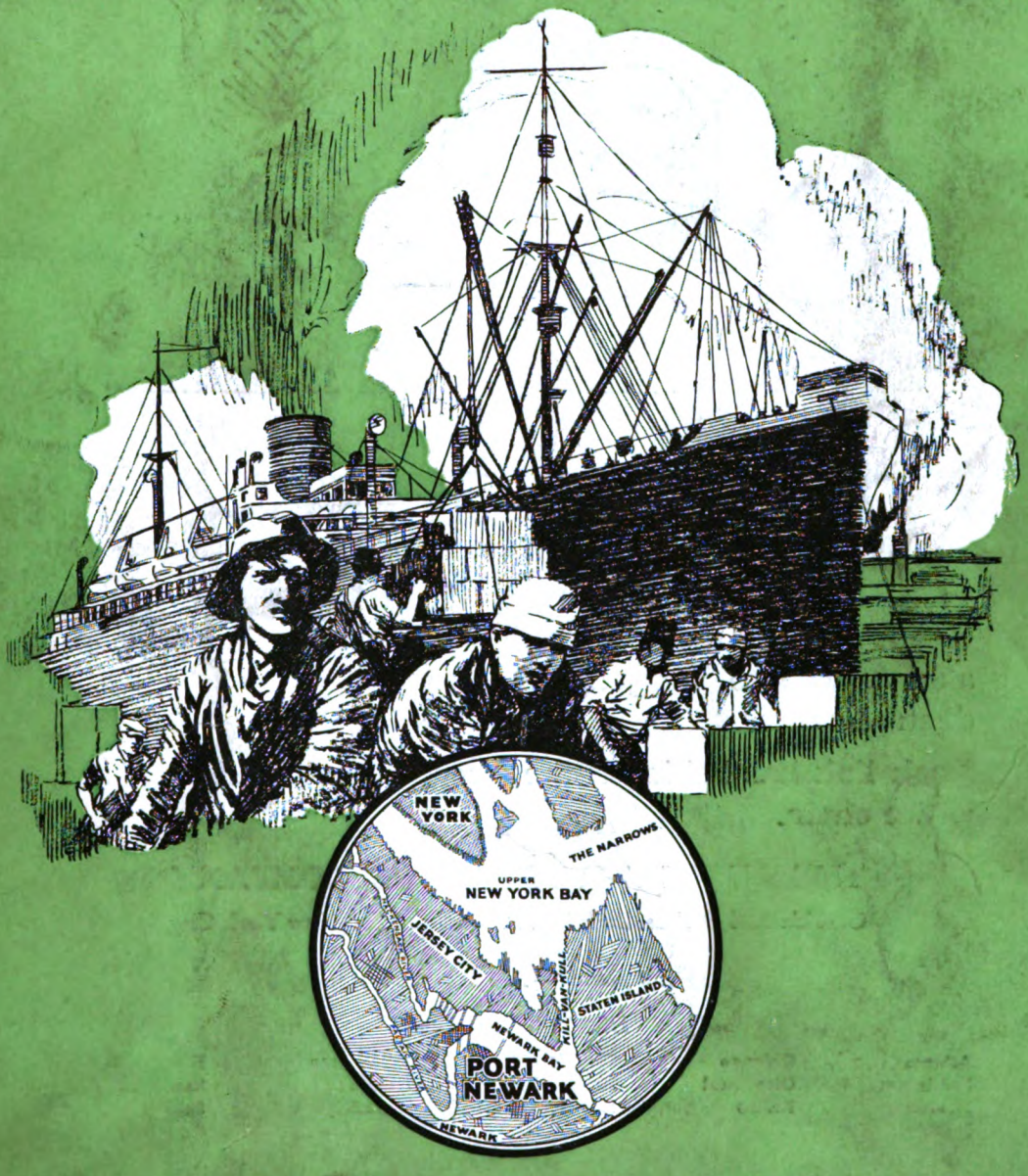

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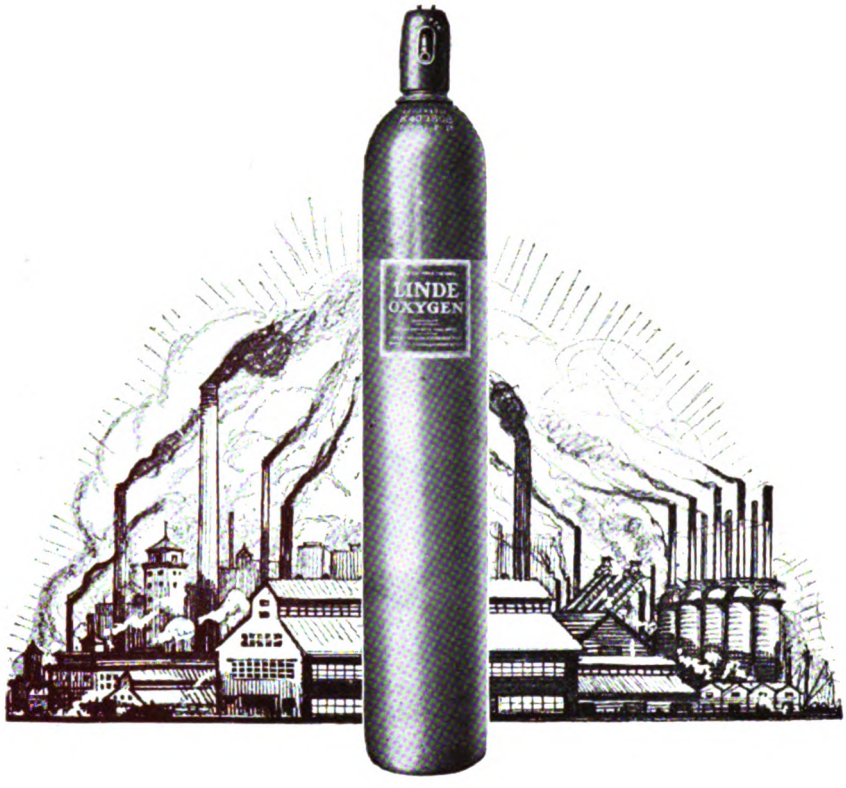

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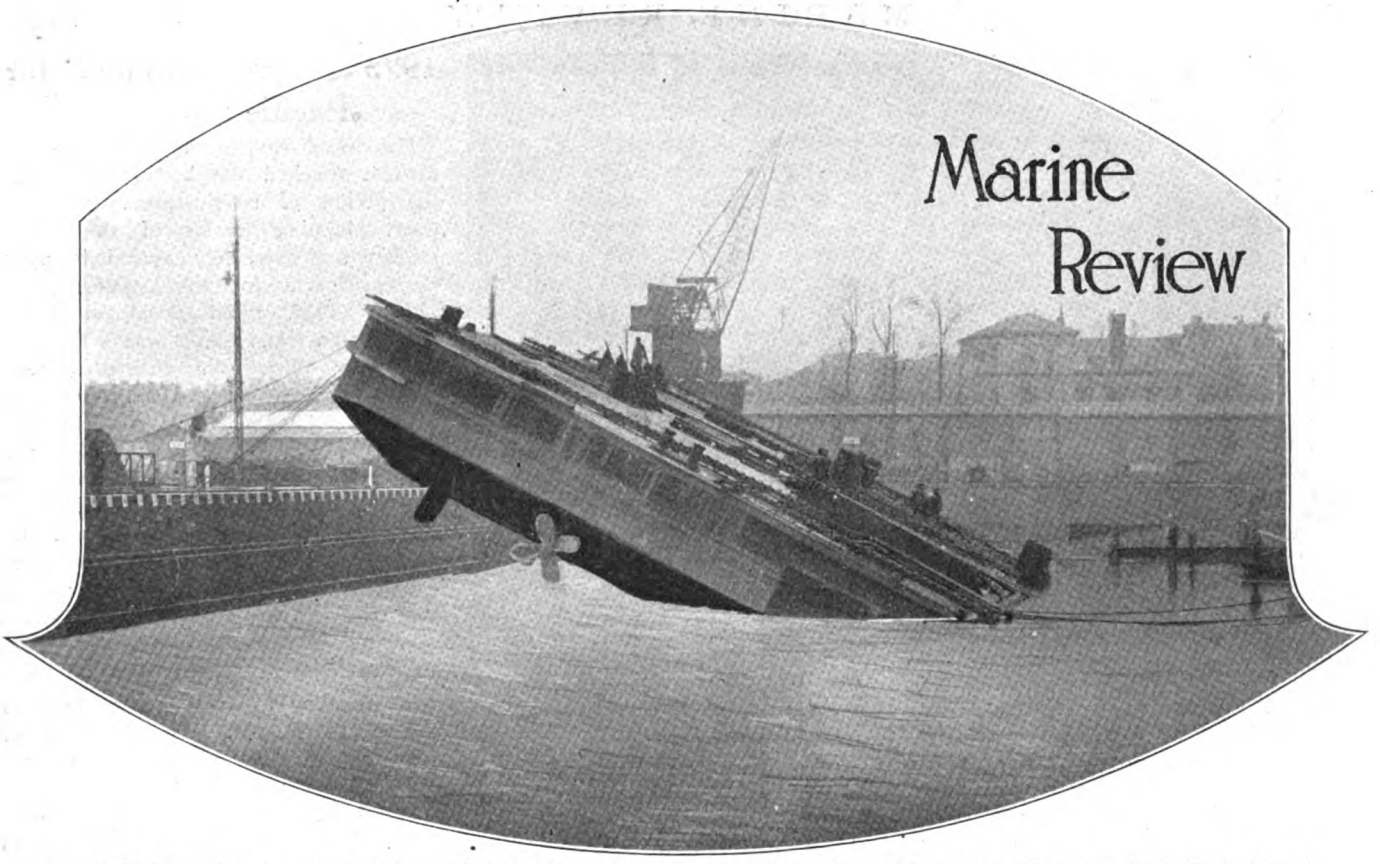

Fig. 1—Position of pontoon after flooding all inner and outer compartments with exception of the forward corner cells which remained empty

Undocking a Giant Pontoon at Kiel

Germans Solve Reparations Problem by Building Pontoon in Dock and Tilting for Passage Through Narrow Gate

BY HUBERT HERMANNS

RECENTLY at the Kiel shipyard of the Deutsche Werke Aktiengesellschaft, a pontoon of unusually large dimensions was completed. The work was done under a reparations contract. The shipping tonnage deliverable under the treaty of Versailles included a certain large floating crane of 250-ton lifting capacity, which it was found impossible to ship overseas to England owing to its size. The building of a similar crane, therefore, became necessary, and the contract was given to several German firms.

The construction of the pontoon re-

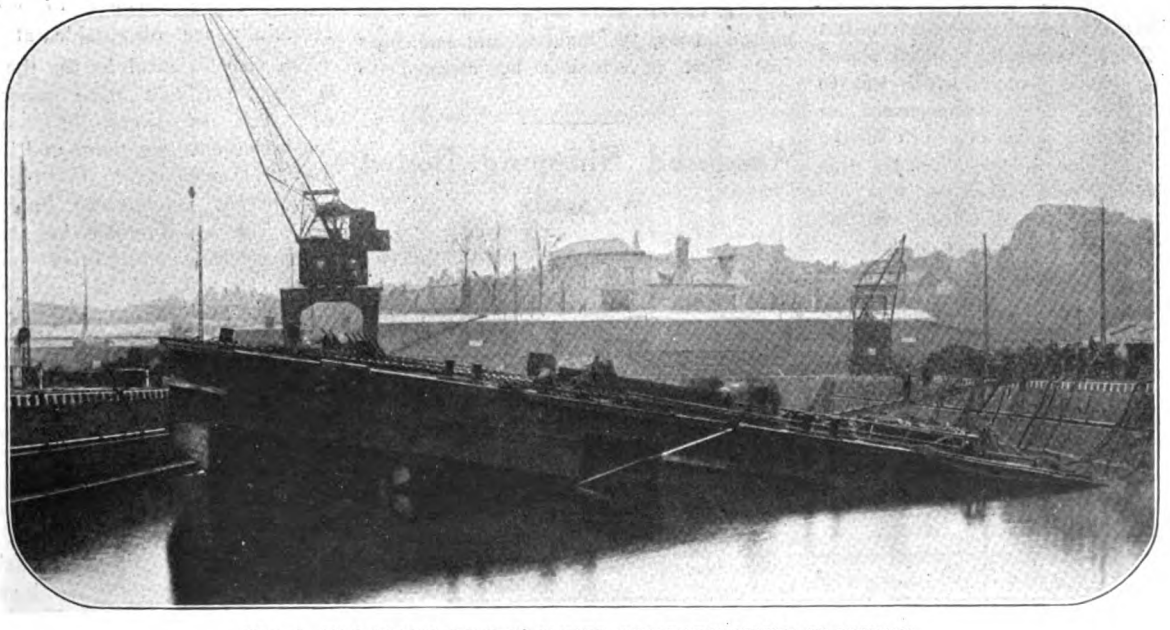

FIG. 2—FLOODING OF THE INNER COMPARTMENTS IS ENDED

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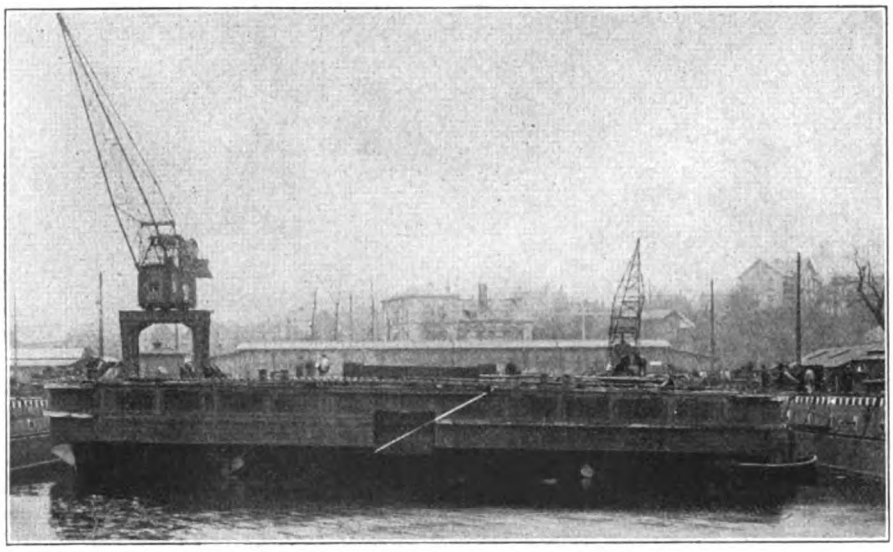

FIG. 3—IRON BALLAST PLACED ON BOARD TO TILT PONTOON

quired for the crane was undertaken by the Kiel shipyard of the German government, in other words the famous Kiel navy yard. Owing to the lack of sufficiently large slips, construction was carried out in a drydock, the gate of which, however, was also too narrow to allow the pontoon to pass. A suitable means of overcoming this difficulty was speedily found, and the new vessel was got into the water in an unusual manner.

Ingenious Plan Is Used

The dock gate is only 27.5 meters in width at the foot and 29.4 meters at the top. The management of the yard decided to heel over the finished pontoon to such an extent as to cause the raised side to project sufficiently far over the dock wall. To do so, a heeling angle of about 30 degrees was necessary. The dock wall is 3.2 meters high above water, while the bottom of the pontoon after being inclined was as much as 4.6 meters above the water level. Iron ballast weighing 200 tons was first of all placed on the side of the pontoon which was to be loaded. The outer compartment on the same side and about one-third of the interior were then submerged. By this means, the required inclination was obtained, and the work of towing out the pontoon, now loaded with a weight of about 2800 tons could now be begun.

This operation of undocking, which was as difficult as it was interesting, was carried out successfully in the presence of representatives of the German government and the British admiralty. As soon as the pontoon was got into open water, pumping was begun. Micrometasurements carried out by officials of the reconstruction ministry showed that no deformations had been produced either by the loading or by the work of transportation through the dock gates. From the technical point of view, the experiment was, therefore, completely successful.

The operation was, however, of importance from a commercial as well as a technical standpoint. On compiling a comparative estimate of costs, it is said that the method of building and launching employed was cheaper than that of building a similar pontoon on slips and launching it from them. As in addition the risks incident to launching were avoided the new method of getting the pontoon afloat actually possesses considerable advantages.

The finished pontoon has a lateral depth of 5 meters and is 50 meters in length and 30.50 meters in breadth. These unusual measurements give it the enormous carrying capacity which makes it one of the largest vessels of the kind ever built. Although the production of this powerful steel pontoon had to be carried out as a reparations obligation, and is, therefore, of little value to German industry, the building and launching feat must nevertheless be credited to Germany.

Assigned Shipping Board Vessels

STORM KING, steamer, 8778 deadweight tons, assigned to International Freighting Corp., New York, for New York-River Plate service.

IMLAY, tanker, 9971 deadweight tons, assigned to Struthers & Barry, San Francisco, for management operation.

PRESIDENT HARRISON, 13,034 deadweight tons, assigned to Swayne & Hoyt, San Francisco, for United States Pacific coast-east coast South American service.

PRESIDENT HAYES, 13,005 deadweight tons, assigned to Swayne & Hoyt, San Francisco, for United States Pacific coast-east coast South American service.

SUSQUEHANNA, 12,000 deadweight tons, assigned to Swayne & Hoyt, San Francisco, for United States Pacific coast-east coast South American service.

1923 Holds Promise for Pacific Shipping

Convinced that ocean freights have at last touched the bottom and that the period of readjustment is about over, shipping circles of the north Pacific are extremely optimistic over the prospects for the coming year. During 1922, rapid development of some ocean trade routes was witnessed. In other directions, disastrous rate wars prevailed but peace has now been declared. The demand for ocean tonnage has been quite active during the last three months and many sailing vessels, idle for more than a year, have been returned to service. If the ship subsidy bill passes and the government adopts a definite policy with reference to the merchant marine, shipping is expected to show wonderful development in the near future.

Illustrating the growth of trade from the north Pacific, the movement of lumber to Atlantic ports may be cited. In 1921, this trade totaled approximately 225,000,000 feet. In the past year, the movement has amounted to more than 600,000,000 feet. Exporters predict that in 1923 more than one billion feet will be shipped to the Atlantic.

During the last month, activity in chartering for Australia featured the market. Lumber space on the regular steamship lines to the Antipodes is already booked for the next three months and several sailing vessels have been fixed, rates having recently advanced from $13 to $15. The market for coal tonnage from Australia to the west coast is weak and rates have declined. From Puget sound to Peru and Chile exporters are offering $14 for sailers to freight lumber while return cargoes of nitrates to Honolulu are obtainable at $6.

On the Oriental berth, the situation is temporarily a trifle weak because of lack of available lumber due to inclement weather and the holidays. However, if this market does not break, transpacific operators believe they will soon be justified in raising conference rates on lumber which at $10 and $11 are sufficiently low to keep out tramp competition. No wheat is moving to the Orient at present but offerings of salt herring, scrap and general cargo, including overland freight, are fairly generous. The Orient is shipping an increasing amount of cargo to the west coast indicating the return of normal business in Japan and China.

Grain freights to Great Britain and northern Europe are weak and have recently dropped from 37s 6d to 33s

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6d. This is due to lack of buying power in foreign markets. However, considerable grain still is to be shipped from north Pacific ports and the indications are that early in the year this movement will be resumed. Canned goods, copper, flour, dried fruit, fish and some lumber are being shipped at present.

The intercoastal berth continues the most active of any. New services are being announced almost weekly and now 18 American lines are operating between Atlantic and Pacific ports. In both directions, the movement of cargo is brisk. Lumber exporters have as yet been unable to get the space they require and lumber freights have firmed more than $2 within the last 60 days. An increasing volume of iron and steel products and manufactured goods is noticed in the westbound movement. Some of the smaller lines on this route are making plans toward the reorganization of the intercoastal conference but the larger companies are not inclined to join at this time.

Lumber is being shipped to southern California in steady volume, the customary lull experienced during the holidays not having appeared this year. Steamer space is in urgent demand and rates are holding firmly at $7.50 to $8. Many coasting vessels are chartered for months ahead.

Sales of Shipping Board Vessels

DIX, army transport, 7212 gross tons, sold on Dec. 11 to the Robert Dollar Co., New York.

LAKE GUNNI, lake type cargo, 4230 deadweight tons and 2686 gross tons, to the Rajah Steamship Co., New Orleans.

CHARLES H. CRAMP, steel cargo, 9412 deadweight tons and 6220 gross tons, to Carey T. Hunter, Baltimore.

HENRY S. GROVE, steel cargo, 9395 deadweight tons and 6220 gross tons, to Carey T. Hunter, Baltimore.

BARRENFORK, steel ocean-type tug, 418 gross tons. Purchased Jan. 2 by S. A. Guilds, Charleston, S. C.

BUTTERFIELD, steel ocean-type tug, 418 gross tons. Purchased Jan. 2 by Newaygo Tug Line, Inc., Wisconsin Rapids, Wis.

LAKE GERA, lake type steel cargo, 4155 deadweight tons, 2637 gross tons. Purchased Jan. 4 by the Lone Star Steamship Co. Inc., Galveston, Tex.

LAKE PEPIN, lake type steel cargo, 2989 deadweight tons, 1997 gross tons. Purchased Jan. 4 by the Hammond Lumber Co., San Francisco.

A. Melville Dollar, formerly managing director of the Canadian Robert Dollar Co., has incorporated the Universal Shipping Co. with headquarters at Vancouver, B. C., for ship chartering and brokerage.

Capt. Benjamin W. Lewis, 75 years old, one of New England's oldest and best known sea captains, died recently at his home in East Boston, Mass.

New Method of Using Gas To Preserve Fruit

Owing to its perishable nature, shipments of fruit by water over long distances and through widely varying degrees of temperature have always required refrigeration in order to deliver the cargo in good condition. Consequently an ordinary cargo vessel has not been suitable for this trade. G. S. Lane, San Francisco, has recently developed a process for the proper preservation of fruit cargoes which is now being tried out in a practical way by the Williams Steamship Co.

Two shipments of grapes, the first on the steamer WILLPOLO and the second on the motorship KENNECOTT, from San Francisco, using this process of preservation have been delivered to Atlantic coast ports. The first of these shipments, according to A. C. Coleman, superintending engineer of the Williams Steamship Co. in New York, was not delivered in good condition, while the second was delivered in much better condition due to improvements in the design and construction of the apparatus. In Mr. Coleman's opinion, contemplated improvements and the experience gained in using the apparatus in a practical manner, will make it possible to carry fruit cargoes in good condition. Grapes are recognized as most readily perishable of all the fruits and, therefore, this test will completely demonstrate the practicability of the new method.

The underlying principle of the process may best be stated in the words of the inventor, "All fruit carries parasitic bacteria, some of which cause mold, others decay, and others fermentation. These bacteria require oxygen, and when deprived of it as when surrounded by gases containing no oxygen, (no free oxygen is meant) they become dormant, their work is halted, and the fruit remains in the same condition as when packed." This process is applicable to any cargo vessel.

Carbonic acid gas is produced by means of a stove burning a good qual-

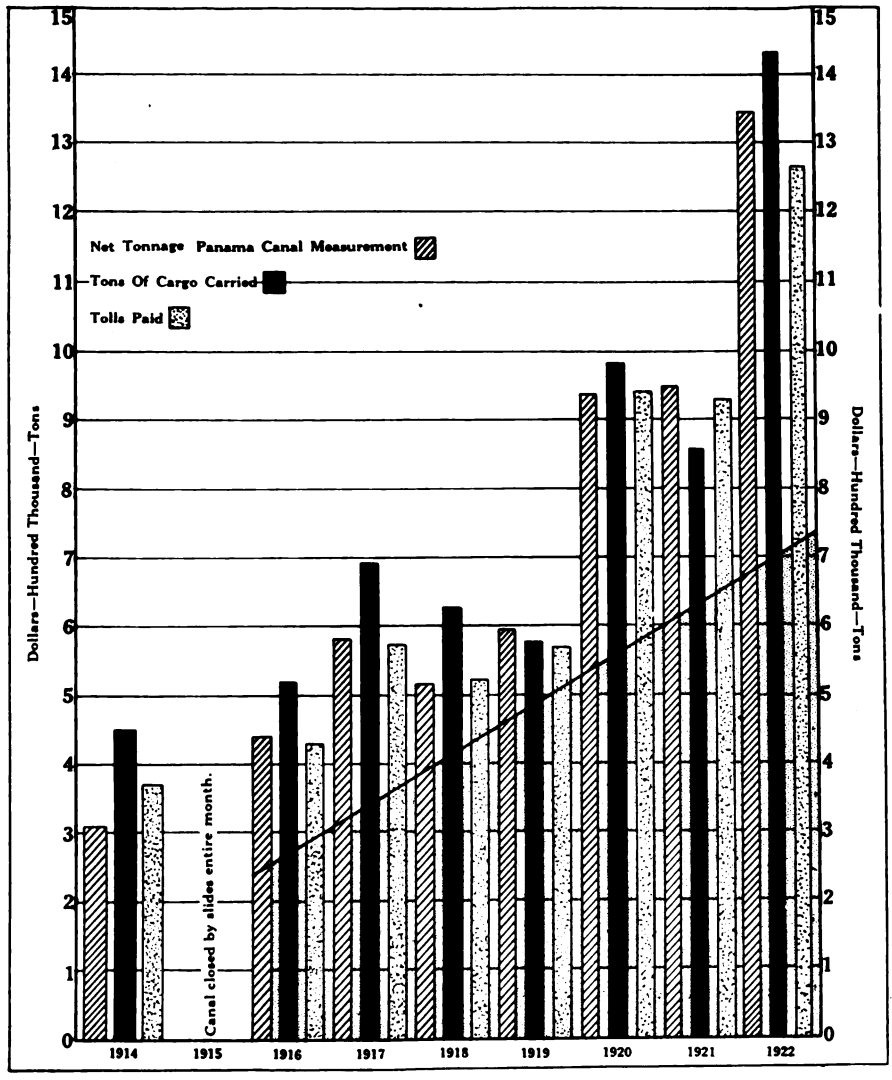

CHART SHOWS PANAMA CANAL TRAFFIC RECORD IN NOVEMBER OF EACH OF THE LAST NINE YEARS. DIAGONAL LINE REVEALS GENERAL UPWARD TREND OF FREIGHT TRAFFIC THROUGH CANAL

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ity of coke. The gas produced by the combustion of the coke with a small addition of sulphur, is washed and cleaned of impurities, dust and any other foreign matter, and cooled by passing through a surface cooler. This gas is then conducted through a main pipe, a 2½-inch pipe was used, delivering to a number of smaller pipes, located at the bottom of the compartment in which the fruit is carried. The smaller pipes are perforated allowing the gas to escape and to permeate through the fruit. Outlets are provided so that the air is dispelled and its place taken by the carbonic acid gas. The sulphurous oxide gas generated by the introduction of the small amount of sulphur tends to prevent mold.

During a voyage the gas producer is kept going constantly, and the gas in the cargo compartment is regularly renewed with fresh cool gas. When within a day or so of the port of discharge, the generation of gas is discontinued, and the carbonic acid gas in the compartment is forced out and fresh pure air pumped in pending the discharge of the shipment.

Though comparatively simple, the process in its present stage of development requires the services of one man in charge and the labor of one man night and day to stoke the producer. Besides the gas producer, the apparatus consists of one 5-horsepower motor, a low pressure air compressor, a washer and a cooler, besides the necessary piping. It can, however, be installed and removed as occasion demands, easily and without much labor. The sizes of the different parts of the apparatus of course increase with the size of the compartment or compartments it is intended to serve.

Boston Sea Trade Is Much Heavier

Rail congestion at ports to the south has caused a marked increase in imports at the port of Boston. The closing of the port of Montreal has also increased traffic at Boston so that activity at the present time is decidedly encouraging. Recently some heavy shipments of grain have been made through Boston and gradually improving industrial conditions in New England are responsible for better trade on many of the regular lines out of Boston. This is especially true of the trade to the east coast of South America where vessel facilities are proving inadequate to handle the freight offered.

The coast to coast trade has kept up regular sailings throughout the past month and one line is negotiating for extra vessels because of the prospect of heavy spring trade. Service from Boston to Havre and Dunkirk has recently been resumed by Patterson, Wylde & Co.

Progress in the rail rate differential case for eastern ports is reported by the committee although no definite decision is looked for until late spring. Ocean freight rates are firm with an upward tendency in many services.

Cherbourg, France, has recently been provided with oil bunkering facilities. The fuel in quantities up to 2000 tons is delivered in the roadstead by means of a tank barge.

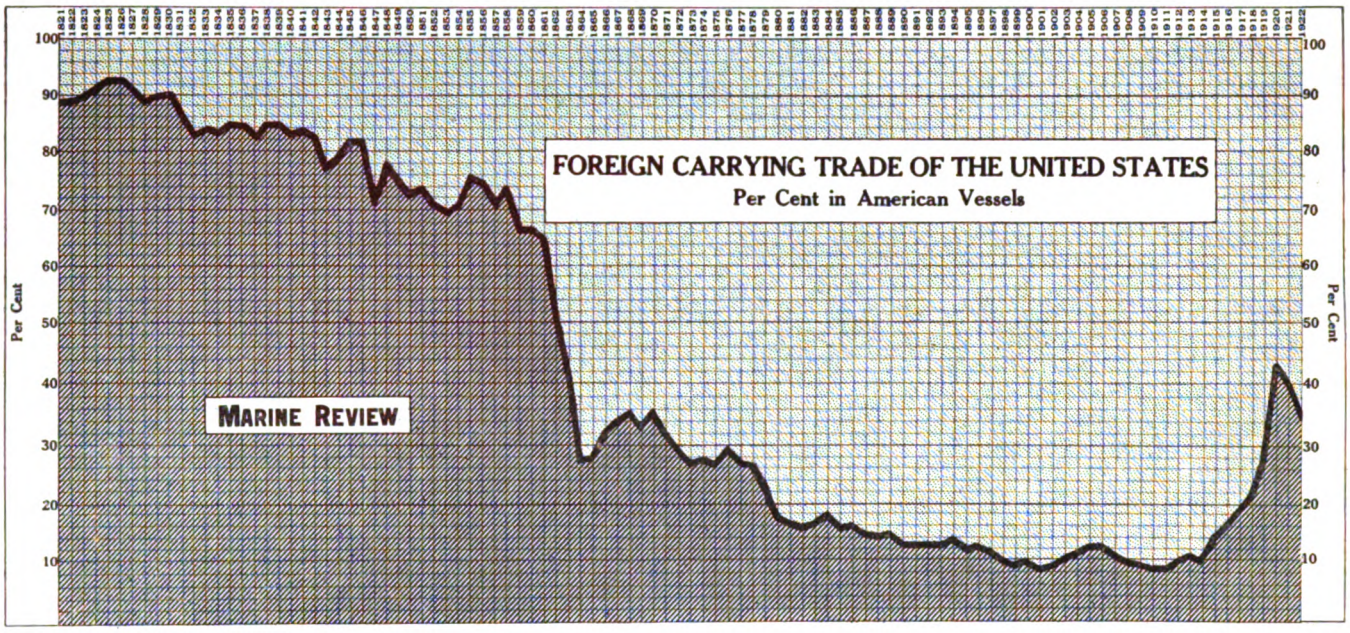
How Shipping Income Is Divided

An interesting study of income derived from transportation by water has recently been made by the national bureau of economic research. The tonnage afloat of the United States compared with the population for each of the years 1909 to 1919 inclusive shows an almost imperceptible decline per capita during the first years of this period reaching its lowest point in 1914. The years 1915 to 1917 showed a moderate increase, followed by a large growth in 1918 and a tremendous increase in 1919.

In percentage, labor's share remained fairly steady in the decade 1909 to 1918, dropping no lower than 72.2 and rising no higher than 85.6 and closing at 83.2 as compared with 83.5 ten years before. The total amount jumped from $173,200,000 to $421,200,000.

The total share received by the operators and investors increased from $34,305,000 in 1909 to $85,230,000 in 1918.

The number of men at work on the vessels of the American merchant marine increased from 149,200 in 1909 to 222,200 in 1919 and the estimated annual earnings rose from $901 in 1909 to $2152 in 1919. Land employes engaged in the industry of transportation by water numbered 58,450 in 1909 with an estimated average annual pay of $664. In 1918 this number had increased to 80,400 and at the same time the estimated average annual pay rose to $1012.



ONE HUNDRED-YEAR RECORD OF THE FOREIGN CARRYING TRADE OF THE UNITED STATES SHOWING THE ANNUAL DIVISION BETWEEN AMERICAN AND FOREIGN FLAG VESSELS. THE HEAVY SHADED SECTION COVERS THE COMMERCE CARRIED IN AMERICAN BOTTOMS. THE LIGHTER SECTION SHOWS THE PROPORTION GOING TO FOREIGN VESSELS

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What Ship Classification Means

Vessel Rating Frequently Misunderstood—Rules and Regulations Cannot Be Too Strict—Central Control Is Needed

BY A. K. ARMSTRONG

CLASSIFICATION of vessels is a subject about which considerable misapprehension exists, even among those who are thoroughly cognizant upon other points pertaining to business in great waters. Judging from the attitude of some who have had occasion to deal with classification societies, the classing of a vessel, in their minds, resolves itself into the transfer of a piece of paper, known as a classification certificate, from the society to the shipowner; the latter then possessing something which will aid him in obtaining a favorable hearing from the underwriters and an asset valuable in case of a sale. Too frequently an owner or operator, having paid a rather inadequate fee for classification, appears to believe that his responsibility to the society has ceased and thereafter he keeps himself and his vessel as far from the society as is possible unless he needs it as a crutch or a life preserver. Even among those whose ideas of the functions of a society are broader, it is too often looked upon as a more or less necessary, but troublesome, pest.

Rules Are Essential

Every classification society has printed rules, in which are described general conditions upon which classification will be granted. The body of the rules is devoted to stating, more or less specifically, the constructional requirements for various types of vessels. Owing to the wood shipbuilding industry having become almost defunct, all of the classification societies have allowed the rules governing wood construction to become more or less obsolete. This fact worked considerable hardship to the various societies during the late war emergency. They were forced, upon short notice, to supply complete rulings relative to the construction of many extraordinarily large wood vessels built in many respects with new materials and original arrangements.

The rules of a classification society should be full and specific. They should be the result of the most careful thought, study and experience in the industry. Any parts which are vague, or treated too generally, must often be left to the interpretation of one man in the society, or be variously interpreted by each surveyor who must take cognizance of them. Under these conditions an error in judgment or lack of judgment might easily result in a poor or expensive ship. It would be vexatious if two vessels, identical in size and design, built in two different places, should, through a difference in judgment of two surveyors of the same society, show considerable variations in functioning or in cost.

Revision Is Required

To make all rules as specific as it is humanly possible to make them and to have all points of construction fully covered, will require, of course, frequent revision of all rules. But this revision would serve, among other purposes, to limit the fads and fancies of individual representatives of a society. The importance of keeping rules specific and up-to-date is a prime necessity since, if this is not done, there is always the possibility of unintentional injustice being worked upon individual owners and builders.

The surveyor should be authorized to observe that the rules are followed and should not be allowed to make rules or invent rulings. It is axiomatic that if the rules are the result of the study and experience of the best talent in the industry, the surveyor, being only an individual, with one individual's experience and judgment, is not a competent authority to change, revise, or interpret unspecific points in them.

A vessel which has been constructed in accordance with the rules or rulings of a society, is assigned a letter, or series of letters, which indicates she has been properly designed to meet the requirements of her service with respect to structural efficiency and that the materials of which she is composed have been properly fitted and fastened. A common method of designating the condition of the vessel at the time of the final survey is by means of the symbol A1. Sometimes, in the case of wood vessels which have been in service for a stated period and met all of the requirements of the society with respect to surveys and stated renewals, this symbol is changed to A1½.

The symbol A1½ means to indicate that the vessel has passed the span of life in which it is economically possible to keep her in first class condition. Possibly some other means of indicating a condition due to age would be better since the age of a vessel can always be readily determined from the particulars in the record or register issued annually by the society. Sometimes, the number of years during which a vessel has been in service, is no indication of her present condition. In any event, her history would be of much more value in determining her fitness for a particular service than the mere statement of the actual period of that life. If a vessel has developed any peculiarities that might render her unfit for the service which she performed under the A1 class; these could be better indicated by restricting the limits in which she can operate; by designating the materials of which she is composed; by restricting her to certain types of cargo; or by limiting her to frequent surveys, such as annually or voyage to voyage.

A vessel which has been surveyed during the entire course of construction, generally has this designated by a particular symbol. In some cases, this is done by means of the mark*. Thus, some vessels show the designation *A1. If a vessel has been surveyed after completion, the symbol * is generally omitted.

Not Fully Guaranteed

Any vessel not built under special survey, from the laying of the keel to final completion, should not be considered as fully guaranteed by the classification society for any extended period. In the case of a wood ship particularly, so much of the work is covered in that it is often almost impossible to determine whether the materials, scantlings, arrangements, workmanship and fastenings are all of a nature that will permit the vessel remaining in first class condition for more than a few years. If the matter is handled equably, the best that can be said in most cases is that the vessel, when surveyed, was so far as could be determined in a condition which would warrant the designation A1. Whether she would be eligible for more than one voyage without examination and survey prior to subsequent voyages is largely problematical. Some apparently small defect, readily observable during construction,

The author formerly was assistant to the chief surveyor of the American bureau of shipping.

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but hard of detection after the vessel is completed, may lead to serious damage of the cargo, or even the total loss of the vessel. It is evident that if the highest class could be assigned wholly upon surveys made after completion, that, provided the builders follow the rules, it would not be essential to exercise a constant observation at the shipyard. Absence of the symbol * may make a considerable difference in the meaning of the other signs and symbols which indicate the class.

Applying the Charges

The value of any society's classification should depend largely upon the closeness with which it has been determined that the rules have been complied. This would require careful and frequent observation by the society's representatives, whose time should be entirely devoted to the society's interests. It is to be anticipated that more satisfactory service to a society will result when its representatives are wholly relieved of any direct dependence for their remuneration upon the fees charged against particular vessels. Relief from any such direct dependence would tend to make all of the society's representatives independent of local conditions in any particular district and increase the efficiency of classification work. These conditions should apply to reclassification as well as to new classification.

When a vessel is fully equipped, it is usual to designate this condition by the symbol (E). The more ancient practice, however, is to include the equipment designation in the A1 or *A1. The equipment designation is supposed to indicate the vessel is fully equipped with anchors, cables, hawsers, tow lines and warps which have been satisfactorily tested in the presence of one of the society's representatives. It also indicates that a sailing vessel has a complete suit of spars and sails, as well as the spare spars and sails required by the society. It also sometimes indicates that a vessel which may not be covered by particular law with respect to such matters, has the complement of boats required by the society. Where the (E) or a similar designation is lacking, it indicates that the equipment either is not complete; is lacking in weight or size; or has not been tested in accordance with the rules.

A class without a symbol indicating a complete and tested equipment is an indication that in the opinion of the society the vessel is not properly equipped, but the absence of the equipment symbol does not indicate the nature or extent of any departure from the requirements of the society. A vessel may depend entirely upon sails as her means of propulsion, or she may have sails as her main motive power with auxiliary machinery to aid her in calms or in entering harbors or she may depend upon machinery entirely. The symbols *A1 (E) usually covers the sailing vessel and auxiliary, provided that the rigging is complete and staunch, the sails all that are required, and the auxiliary machinery installed so as not to affect the structural efficiency of the vessel. Since gasoline engines are the auxiliaries most commonly employed, certain standard types are ordinarily approved. It would seem, however, that auxiliary wooden vessels are greater than the ordinary fire risks, many of them being lost through burning. This would indicate that special rules should be required to govern the construction and protection of wooden auxiliaries. But whether this is a subject for national law, underwriters' requirements, or the rules of the classification societies is difficult to determine.

A full powered vessel is generally assigned a special symbol if the machinery and boilers have been built and installed under special survey. In some cases this symbol is *A.M.S. and signifies the materials entering into the construction of the machinery and boilers have been inspected and tested; that the boilers and machinery were surveyed and tested during construction; and that the installation of these parts in the hull, together with all their accessories and connections, was done under the observation of a representative, and in accordance with the rules of the society. Where the symbol * is lacking, it often means that the boilers and engines were not constructed under special survey and, sometimes, that no survey was made upon them until after installation.

Meaning of Symbols

Apparently a considerable difference exists between the two symbols, *A.M.S. and A.M.S. In one case there is evidently a guarantee that the engines and boilers are first class and capable of performing satisfactorily for a period of years fixed by the society, provided, of course, they are properly operated and maintained and in the other case, it seems to be indicated that so far as the representatives of the society who made the survey could determine, the engines and boilers are likely to operate satisfactorily.

Sometimes it is considered that, since a vessel is constructed for a particular service, within defined limits, the requirements relative to scantlings, arrangements and fastenings can be considered amended. Thus, a small, light tug may be classed for harbor service, and a comparatively lightly constructed vessel, not built to meet ordinarily heavy weather in the open sea may be classed for inland, bay and sound service.

When the matter of classes covering vessels which are to operate in the open sea is considered, the conditions become more involved. On the Atlantic coast of the United States, a great deal of traffic and trade are carried on by vessels which run for long distances practically within sight of land. These vessels are often considerably lighter in construction than those which engage in deep sea trades and, in many cases, they are not equipped to navigate alone. The lightest of these vessels are generally limited to short coastwise service, the limits of which are apparently somewhat elastic; although none of them are supposed to pass around Cape Hatteras. Other vessels, of more substantial construction, are assigned a coastwise class, which, in accordance with insurance practice, limits them to traffic between the most easterly port in the United States and the Atlantic ports of Florida.

Limited to Port-to-Port

Apparently, the intention of such a class is to limit a vessel to port-to-port navigation. By passing from port to port, or lightship to lightship, the master is enabled to keep himself closely posted as to probable weather conditions and, in case of heavy weather coming on, he is informed sufficiently ahead so as to be able to run for shelter. It is evidently not the intention of this class to permit a vessel to run off shore and ride out a heavy storm.

The assignment of a coastwise class to vessels operating on the Pacific coast of the United States would not be advisable, it would seem, since suitable harbors of refuge are so few and so widely separated that any vessel many times in her life would be compelled to fight it out in the open sea. The latter fact would call for a more substantial vessel than is generally constructed for coastwise service.

Another general type of service is fixed by the limits entailed in a coastwise and West Indies class. This covers broadly the Atlantic coast of the United States, the coasts of all the West India islands, the Gulf of Mexico and the Caribbean sea. Apparently the insurance rating covering this class admits of navigation as far as Cape St. Roque, but recently and probably more correctly one classifi-

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cation society has set the southerly limit of this class at Trinidad. The writer is unable to state upon what basis the limits of this class were originally fixed, but from all appearances it would seem that in certain portions of the year at least navigation off shore in the open waters of the Gulf of Mexico and Caribbean sea would require as staunch a vessel as would be required in the open waters of the north Atlantic. The fact that the class reads *coastwise* would indicate that port-to-port navigation is in mind, both on the coasts of the American mainland and in the islands of the West Indies.

Meaning of Coastwise

Possibly, it is intended to depend upon the operators conforming to established custom with respects to the limits and methods of navigation allowed under this class since it seems apparent that conditions upon portions of the Mexican, Central American and South American coasts do not permit the port-to-port navigation of other coasts coming within the limits of the class. It is to be noted that some operators consider that the coastwise and West Indies class permits them to strike out directly from northern United States ports to the easterly West Indies, or across the Gulf and the Caribbean sea. If it is intended to operate vessels in this manner in all seasons of the year, it is evident they should be constructed in accord with the rules governing unlimited service.

Another type of service is that which falls within the limits of the great coastwise class. This usually permits of coastwise service along both coasts of North and South America, including the West Indies. This seems to be based upon an insurance rating but it is apparently somewhat difficult to determine from the classification society's standpoint, how the limits of such a class should be governed. On the Pacific coast of North and South America a strict interpretation of port-to-port service is out of the question, since that coast is but sparsely provided with safe ports, widely separated. Quite frequently a vessel would have to remain in the open sea and endure the severe buffetings of storms that would try a ship built for service in any part of the world. It also is to be noted that sailing vessels proceeding on the Pacific from South American to United States ports are frequently forced to stand away 1000 miles from land in order to pick up a wind favorable to their undertaking.

Risks, due to local navigational difficulties, are the province of the underwriters, and do not come within the cognizance of the classification societies. Due to local conditions, Torres Straights, the Bay of Fundy, the south coast of Sumatra, the Straits of Magellan, etc., are sometimes the subject of special provisions and prohibitions in the marine insurance policy. The class issued by a society guarantees that a vessel may proceed anywhere within the general limits fixed by the class as long as there is sufficient water to float her, but the responsibility of keeping her afloat lies entirely with her operators and navigators who protect themselves against conditions of this kind through insurance. Under present procedure the classification societies have no more to do with local conditions of temperature, submarine topography, or like matters, than they have with barratry, piracy, or the risks of war. All of these risks come within the province of the underwriter, since the minute a vessel becomes lost or damaged through causes other than stress of weather she practically loses her class. Class covers only a vessel that is afloat and able to float satisfactorily. When she ceases to float or to navigate properly her class is lost, or remains in abeyance, until she is again able to function satisfactorily.

Classed For Term of Years

Most societies add to the designation of class, equipment, machinery, and limits of service, a term of years. Thus a vessel may be classed *A1 for 12 years or *A1 for 20 years. The significance of the term of years is so largely misunderstood.

It is possible that a term of life of 100 years might be assigned a vessel and the vessel may be made to last that long. At the end of that period the vessel would have been many times renewed whereas her identity would not have been lost. Hence, the significance of the term of years means nothing, unless fixed with respect to the vessel as originally constructed. What the society is supposed to do is to guarantee that if a vessel is properly operated and maintained, the charges for maintenance during the period of years assigned will not be excessive. The term of years should be a function of the materials of which the vessel is composed as the economical life of the structure will depend upon the resistance of these materials to the progress of decay, corrosion, and similar factors. The old practice of assigning a larger term of years to the steel ship than to the wood ship composed of durable woods was based upon a misapprehension. It was probably feasible in the old days, and particularly with the wood ship, to properly set a term of years; but in these later days any equable determination of a classification period is extremely difficult due to changes in materials, greater variability in design, more extensive and intensive traffic, the great increase in the number of types of cargo, and similar conditions.

The classification society, in assigning a class, states that when last seen the vessel was in a certain condition, generally first class; fully equipped; structurally capable of operating in unlimited or a defined limited service; and if properly operated and maintained, able to continue to be structurally capable of operating in the service at normal charges for maintenance. The class does not indicate that a vessel is economical in operation, a comfortable sea boat, a fast or steady voyager, or anything similar, as such points are the responsibility of her designer.

A classification society under present procedure does not concern itself with the ability of a vessel to traverse between two points on her fuel and water capacity if she is a full powered vessel. The A. M. S. or *A. M. S. or similar symbols do not generally guarantee that a vessel with a certain bunker or tank capacity will carry enough fuel and water to enable her to make any voyage within the limits of her designated service. This is a function which devolves entirely upon a government department or the underwriter. This is consistent, in that so far as the society is concerned, bunker and tank space to carry the vessel upon any voyage can be made available at the expense of cargo space. The society is not concerned with the economies of operation. A society does, however, ordinarily take cognizance of the power of sailing vessels because if the sail power is much below the normal, a vessel may be restricted to the limits ordinarily assigned barges.

Sanitation Vital Problem

The method of housing the crew is not a function of the classification society. It is evident, however, that from the standpoint of risk, the comfort and health of the crew are vital problems. Many a vessel has become a total loss through sickness or death among her crew. So far as the classification societies are concerned even sanitation is only made the subject of rules and rulings when it affects

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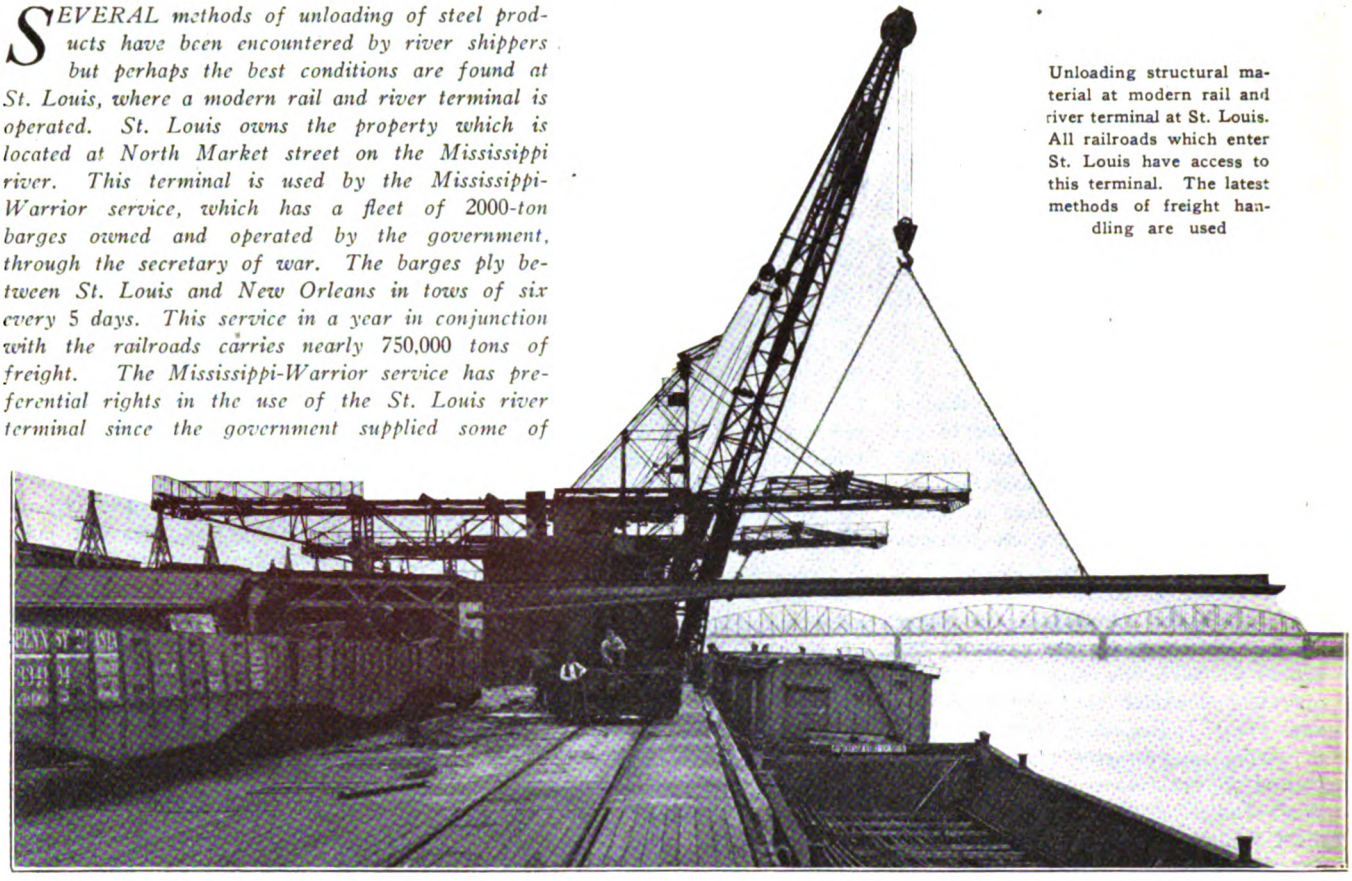
Cities Improve Terminal Facilities To

SEVERAL methods of unloading of steel products have been encountered by river shippers but perhaps the best conditions are found at St. Louis, where a modern rail and river terminal is operated. St. Louis owns the property which is located at North Market street on the Mississippi river. This terminal is used by the Mississippi-Warrior service, which has a fleet of 2000-ton barges owned and operated by the government, through the secretary of war. The barges ply between St. Louis and New Orleans in tows of six every 5 days. This service in a year in conjunction with the railroads carries nearly 750,000 tons of freight. The Mississippi-Warrior service has preferential rights in the use of the St. Louis river terminal since the government supplied some of



Unloading structural material at modern rail and river terminal at St. Louis. All railroads which enter St. Louis have access to this terminal. The latest methods of freight handling are used

the structure, or possible deterioration of the structure.

Ordinarily the proper loading of a vessel is, in the United States, made the responsibility of the underwriters, through their assumption of the risk. The protection of the crews against overloaded vessels is largely left to the ship operator and underwriter together and, in some cases, may be subsidiary to the carrying of cargo. In this respect the United States is far behind the Venetians of the sixteenth and preceding centuries who had ordinances requiring crosses to be marked on both sides of the ship, above which, in the first five years, the water level could go two feet three inches; in the sixth year, two feet, and in the seventh eighteen inches. The penalty for the violation of this load line law was double the value of the excess goods which caused the extra depth of the crosses.

Until a load line law, similar to that enforced by the British government, is passed in this country, it is within the province of the classification societies to grant any class subject to freeboard assignment. The strength and carrying capacity of a vessel are figured upon a particular draft and if she is loaded so that this draft is increased, she is likely to become structurally unsafe. It should be the function of the societies to see that the draft at which a vessel is to be operated, is fixed, and it should be the responsibility of the operator and the underwriter to see that the draft is not exceeded. If the operator through lack of fear of a penalty which should be prescribed by law or the underwriter through lack of information does not enforce the load line requirement, the classification societies, in order to guarantee a safe vessel, capable of service within the limits of her class, should see to it that their requirements with respect to freeboard are enforced. This might require additional service and an increase in the fees charged for classification.

A vessel may be loaded improperly within the limits of her freeboard requirements, so as to be cranky or listed. When this is the case, the vessel is improperly operated and it should be the society's responsibility to withdraw her certificate as soon as this condition is called to attention. Conditions of this kind should be guarded against in any law which otherwise covers the proper loading of vessels.

It is not uncommon to find vessels in distress through the inexperience of officers and crews. Such a condition is the function of national law but if inexperienced or incompetent officers and crews are hired the vessel or vessels are not being properly operated. Consequently, a vessel so manned is not seaworthy, within the strict interpretation of that term and if a vessel in distress through the inexperience or incompetence of her crew comes to the attention of the society in which she is classed, that society should assume the responsibility of suspending her certificate until an experienced crew is put on board. It is probable that, in some cases, the society would be exhibiting a proper exercise of its functions if it suspended the certificate covering a vessel in which the inexperience of the crew was evident prior to any actual distress.

The classification certificate also should be granted to a vessel being properly maintained. The only way in which this can be determined is

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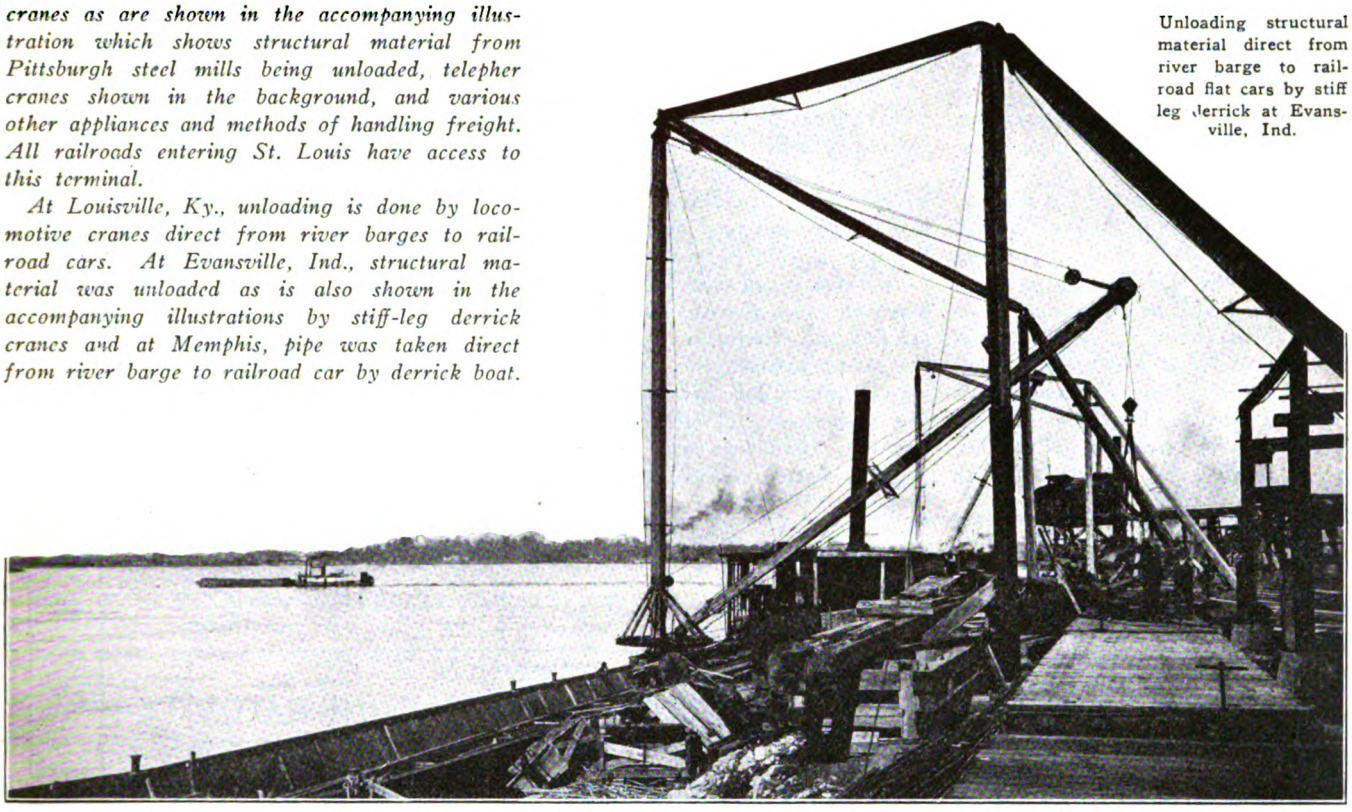
Share in Benefits of River Traffic

the funds used for construction. It has all modern unloading devices including locomotive cranes as are shown in the accompanying illustration which shows structural material from Pittsburgh steel mills being unloaded, telepher cranes shown in the background, and various other appliances and methods of handling freight. All railroads entering St. Louis have access to this terminal.

At Louisville, Ky., unloading is done by locomotive cranes direct from river barges to railroad cars. At Evansville, Ind., structural material was unloaded as is also shown in the accompanying illustrations by stiff-leg derrick cranes and at Memphis, pipe was taken direct from river barge to railroad car by derrick boat.



Unloading structural material direct from river barge to railroad flat cars by stiff leg derrick at Evansville, Ind.

through the ability of the society to see the vessel at frequent intervals. It should be mandatory that a representative be called to view a vessel every time she is drydocked, if it is only for painting, and the reason for drydocking and the extent of repairs, if any, should be endorsed upon the certificate. A general observation of the condition of the vessel should also be made and the society should insist, particularly in the case of a wooden vessel, that she be thoroughly cleaned inside. In the days of inferior materials, the bottom of a wood vessel should be tried for possible shipworm attack and her calking tested for hardness every time that she is drydocked, the representative of the society being called in all cases. Some operators would object, upon the ground of expense, to having a vessel examined so often but this could probably be adjusted through the society charging a fixed annual fee against all vessels for surveys having to do with maintenance and repairs.

In the *Rules for the Construction, Inspection and Characterization of Sail and Steam Vessels*, Buffalo, 1876, a prefatory address by the proprietor of the Lake Vessel Inspection will be found. A portion of this reads as follows:

"It is within my memory that a committee of the British house of parliament was appointed to investigate the causes of the greater loss of life and property on British, when compared with American, ships. The committee reported that American ships were better models, better built, better manned, better officered and commanded."

It is evident from this that a great merchant marine depends upon the quality of the naval architects; the quality of the builders; the education and experience of its officers; and the type of men who compose the crews. All of these matters require correlation under a central and progressive authority before a great merchant marine can result.

The moral tone of a classification society must be high if it is to give efficient and impartial service. Where two or more societies are competing in the same field, the moral tone of all may be more or less fixed by that of any one which is lax in the enforcement of its requirements. Consequently, all classification societies operating in this country should be subject to a central form of control.

A central control, either through a business like department of the national government or a close and powerful association of all the shipping interests in the country could require the classification societies to have comprehensive rules and to enforce them impartially. Likewise, it would be in a position to require all marine insurance companies and underwriters to accept the classifications of the societies whose actions it controlled and, if necessary, increase the scope of the societies to the extent that the placing of insurance, after classification, would be a simple and expeditious matter.

The probabilities are that a central control would ultimately extend its authority, within bounds, to a general supervision of design, classification, insurance, officering and manning of vessels flying the American flag; the regulation of existing trade; and the opening of new routes. It should be plain that only a strong and efficient central control of all matters pertaining to ships and shipping will make the American merchant marine.

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British Ships Cut Costs in 1922

Owners During Year Worked to Revive Shipping by Making Transportation Costs Lower—More Optimism Is Revealed

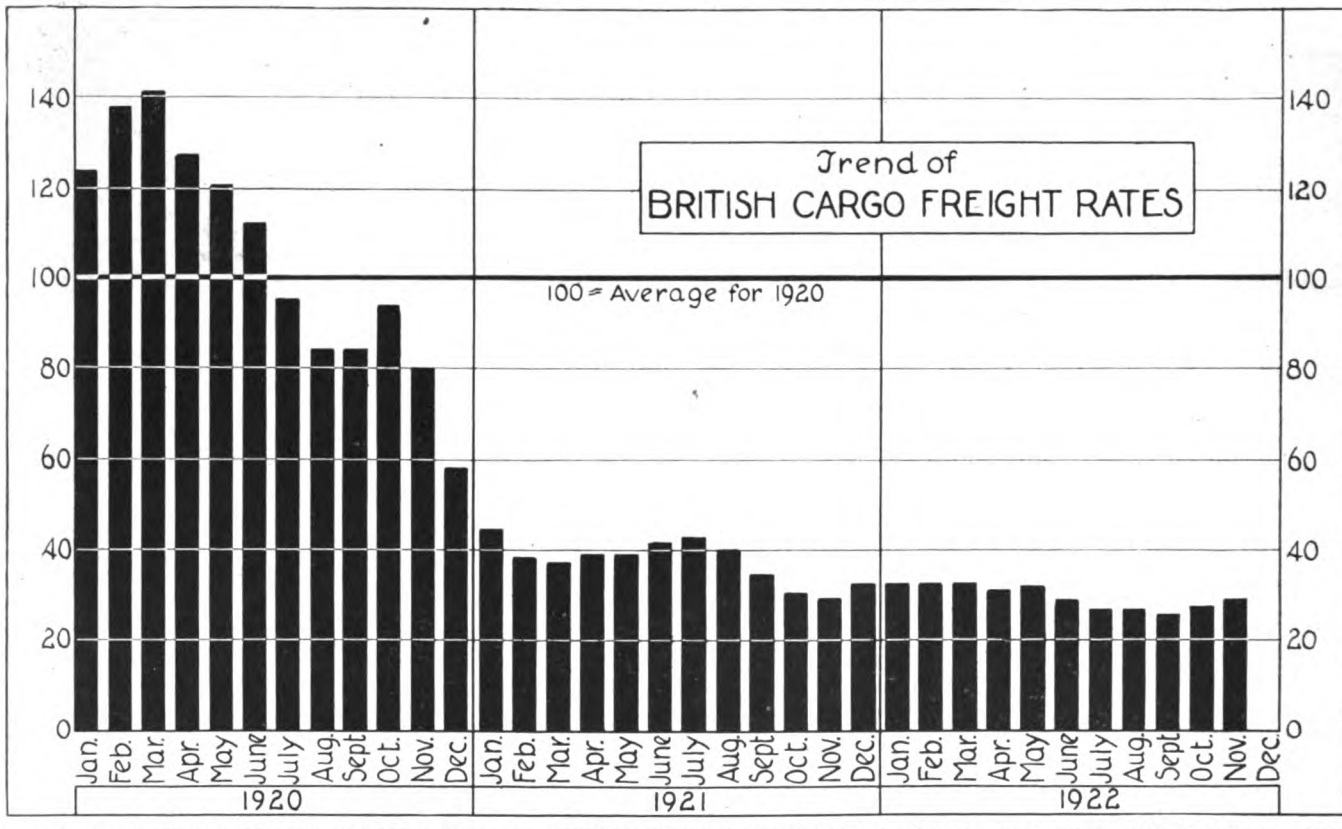
BY CUTHBERT MAUGHAN
Shipping Editor, The Times, London

TOWARD the end of December, Sir Owen Philipps, a past president of the chamber of shipping of the United Kingdom, chairman of the Royal Mail Steam Packet Co. and allied shipping lines, and at present president of the London chamber of commerce, presided at the annual meeting of the Argentine Navigation Co. This is an enterprise which has a large coasting business in Argentina and in the past two or three years, owing mainly to labor troubles its experience has been very unfortunate. In reviewing the accounts for the past year, Sir Owen Philipps, the chairman of the company, declared that there are indications that low-water has been reached and that the tide, although slow, has definitely turned. Sir Owen Philipps dealt exclusively with the experience of this particular company, yet it would not be unreasonable to suppose that if he had been referring to the condition of British shipping as a whole, he would have used very similar words.

Running through the comments of recent public utterances there has been a thread of subdued optimism. But it is only a thin thread. Chairmen of corporations can not forget that they have to meet the stockholders a year hence, and they are usually careful to guard against the contingency of an optimistic forecast being belied by the experience of the ensuing 12 months. Prudence will suggest that it is far better to present to the stockholders better accounts than had been anticipated than after raising hopes to dash them with cold unsatisfying figures. So even if the outlook were indeed rosy, we could not look for much bright coloring in chairmen's speeches. As a matter of fact, in striking a note of subdued optimism, company chairmen are doing probably precisely what the present circumstances justify, since no facts could be produced in support of unlimited confidence in the future.

There is the further consideration that 1921 was a most unfavorable year for the shipping industry, and, while the conditions are now somewhat better, the improvement is really only relative. A great recovery is still needed before prosperity will be restored to the industry. Yet no one believes that prosperity could suddenly succeed adversity. The change must be a gradual one, and as long as there seems to be a steady movement in the right direction all engaged in the shipping industry are entitled to take heart. A steady recovery based on solid grounds would be far more satisfactory than a sudden outburst of activity and then a sharp subsidence to stagnation. There are distinct signs that a steady recovery in British shipping is in progress.

From the shipowning point of view, one of the most favorable features



GRAPHIC FLUCTUATIONS IN FREIGHT RATES RECEIVED BY BRITISH VESSELS DURING THE PAST THREE YEARS. THE TABLE UPON WHICH THE CHART IS BASED IS GIVEN ON PAGE 54 AND SHOWS THE HIGH POINT WAS IN MARCH, 1920 WITH 141 AND THE LOW POINT IN SEPTEMBER, 1922, WITH 26.7. THE AVERAGE FOR 1920 IS TAKEN AS THE BASE OF 100.

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of the year has been the marked progress made in the direction of lower working costs, which was indicated in MARINE REVIEW last February to be a keynote of 1922. The adjustment to normal conditions was gradual and lagged far behind the downward movement in rates of freight. Cargo steamship rates may easily fall many points in the course of a few days, and when the rates began to fall from the giddy heights realized during the war period and down to the middle of 1920, they were no respecters of persons. It was the old story of the law of supply and demand. Commerce began to dwindle, and as the demand for tonnage began to fall freights came down rapidly. The cost of coal and of stores did not fall so quickly, and wages and port charges remained on the high level to which they had been raised during the period of hectic activity. These rates had been agreed to by negotiation and could be altered only by discussion and negotiation. The need for adjustment was, however, so plain to all that the negotiations were carried on without any friction. By agreement, seamen's wages were reduced on March 1 and again were brought down on May 1. Early in 1922 there were known to be some 30,000 officers and men of the British mercantile marine out of employment and rows of idle ships were to be found laid up in the ports and rivers of the country. How to get these men and their ships again in service was naturally one of the chief problems confronting owners. The only way of doing so appeared to lie in the direction of increasing the commerce of the world, and the most effective way in which the shipping community could do its part was by offering cheap transport. With all the costs of transport reduced to the minimum, merchants might again be tempted to commercial ventures and the wheels of commerce which had become so sluggish in their movement might against be got to revolve more quickly.

Another direction in which shipowners moved was to secure a lowering of the port charges throughout the country. These had been raised to extraordinary levels, and in some cases, as the result of increased wages, they were at one time, as much as 150 per cent above the prewar level. Merchants and manufacturers joined wholeheartedly with the shipping representatives to urge the need of lower rates, claiming that the cost of dealing with the ships at British ports and of handling cargo was an undue burden on commerce, and making the further point that the charges in the United Kingdom were higher than at various continental ports, to the advantage of continental commerce and the disadvantage of British trade.

Since there is, I believe, sometimes a feeling in the United States that British working costs are unduly low and that consequently Britain is able to keep her freight charges low, it may be pointed out that a serious complaint on the part of British merchants and manufacturers during the past year or two has been the lower level of freights at times charged to and from the continent, as compared with those in the United Kingdom trade. The lower level in the continental trade is directly due to the very keen competition of the continental steamship companies whose working costs are often below those of British companies. Protests have been made by British merchants and manufacturers against this discrepancy in freight rates, but they have themselves seen the quandary in which British shipowners have been placed. The owners had to consent to rates to and from the continent on an equality with those quoted by foreign steamship companies, or else withdraw from the trade. Shipowners were able to show that the cost of dealing with the ships in continental ports and of handling the cargo there was often considerably cheaper than in United Kingdom and, when they realized how matters stood, merchants and manufacturers joined with the shipping companies in urging reductions of charges at British ports. The port authorities, in turn were confronted with the need of reducing their labor costs, since commerce had fallen to such small proportions that they had been relying on comparatively high charges on a small volume of trade to pay their way.

The port of London authority was in the van in reducing its rates, and a lower scale of charges came into effect as from July 31. Further representations were made by the trading interests and the decision was taken by the authority to make further reductions as from Jan. 1, 1923. The dock and warehouse dues, rates and charges in London now range from 55 to 65 per cent above the prewar level. The various trading interests, while fully appreciating the spirit in which their representations had been met by the port of London authority, believe that the general level should not be more than 50 per cent above prewar rates. In the autumn, rates were lowered at Liverpool, Southampton, and other important ports, and at the end of the year negotiations were still proceeding with a view to a further general reduction of the scale. The cost of bunker coal is also lower but with the revival of the export coal trade further reductions in coal hardly appear to be in sight for the immediate future. The general reduction in working costs enabled freights well below those ruling in 1921 to be remunerative in 1922.

The success of the efforts that have been made to find employment for tonnage is indicated in the statistics of tonnage laid up as compiled by the chamber of shipping. These showed that on the basis of the returns of 36 principal dock and harbor authorities, there were 1023 British vessels of 1,852,000 tons laid up, on July 25, 1921. On Jan. 1, 1922 the corresponding figures were 712 vessels of 1,307,000 tons. By April 1, 1922, the figures had fallen to 484 vessels, of 836,619 tons. By July 1, 1922, a quiet period of the year—the figures rose to 583 vessels of 1,112,000 tons and by

British Shipping Index

PRICES OF REPRESENTATIVE SHIPPING SECURITIES IN 1922

Securities	Highest £ s d	Lowest £ s d
Cunard, £1 shares.....	1 4 0 (April 21)	0 17 0 (Feb. 9)
Furness, Withy £1 shares	1 15 3 (Dec. 4)	1 2 9 (Feb. 13)
P. & O. deferred £100 stock	342 0 0 (April 21)	271 0 0 (Feb. 7)
Royal Mail S. P. C. £100 stock	101 0 0 (April 25)	82 0 0 (Jan. 6)

SHIP CONSTRUCTION IN UNITED KINGDOM, FOURTH QUARTER, 1922

	Gross tons
Tonnage launched	260,588
Tonnage commenced	231,187
*Tonnage building Dec. 31.....	1,468,599
Tonnage launched in 1922.....	1,050,683

*Nominal figure, includes 348,000 tons of construction suspended.

SHIPPING MANAGEMENT FACTS IN 1922

	Highest £ s d	Lowest £ s d
Time Charter Rate: Ordinary British steamers per ton deadweight per month.	0 5 0	0 4 0
Voyage Rates:		
Plate-United Kingdom grain, per ton...	1 17 6	0 18 6
Australia-United Kingdom grain, per ton	2 12 6	2 0 0
Cuba-United Kingdom sugar, per ton..	$6.50	$5.50
South Wales-Buenos Aires coal, per ton	0 19 0	0 11 6
Chile-United Kingdom-Continent nitrate, per ton	1 15 0	1 1 6
Fuel		
Coal: Best Welsh large S. Wales, per ton.	1 10 0	1 4 0
Oil: Per ton at Port Said.....	4 2 6	3 17 6
Wages:		
A. B. seamen, per month.....	10 0 0	10 0 0
Firemen, per month.....	10 10 0	10 10 0
Assistant stewards, per month.....	9 5 0	9 5 0
Boatswains, per month.....	11 10 0	11 10 0

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Oct. 1, the figures had again fallen to 456 vessels, of 824,000 tons, being the lowest of the year. As compared with the returns for 1921 this increase in the employment of British ships is remarkable.

The year 1922 opened fairly auspiciously for ordinary cargo steamers and in the late summer months the demand for tonnage to carry coal, and also iron ore, to the United States was a very favorable factor. The River Plate market, one of the chief freight markets, showed considerable activity. Early in the year freights for the homeward voyage were on the basis of about 37s 6d per ton, as compared with 45s twelve months previously, when working costs were higher. In the first three months of the year the freights declined, and by the middle of March they were on the basis of about 25s per ton, at which level they remained for some little time. Then, in the summer months and early autumn, they declined, and the lowest rate of 18s 6d per ton was touched. In the autumn there was a recovery, and in November the basis of between 30s and 35s per ton was reached. Again there was a little decline at the end of the year and rates fell to the basis of about 27s 6d per ton. In the late autumn a good deal of tonnage was secured for loading homewards in the first three months of the new year.

As usual, the outward coal freights to South America moved in contrary fashion. When the homeward grain rates fell to their lowest point the outward coal rates advanced to as much as 18s and 19s a ton and then by November when the homeward freights were on a comparatively high level they fell to between 11s 6d and 12s a ton. When rates were on this low level they were regarded as unattractive by owners, since the cost of discharging is put at about 3s a ton and after deduction of brokerage, the net freight to the owner was only about 8s a ton. Taking into account the time spent in loading coal —the Welsh ports are seriously congested—some owners preferred to send their ships to South America in ballast. The transport of grain from Australia absorbed a good deal of tonnage through last year, and other markets which from time to time showed fair activity were those for the transport of sugar from Cuba and Java and rice from Burma. The Chilean nitrate trade hardly realized the the expectations which owners at one time had of it. The St. Lawrence grain shipping season was a very active one and in the autumn months, until navigation was closed a large amount of tonnage was secured to bring grain from Montreal. Some of the shipping chartered had proceeded to North America with coal.

Last year the hopes which are usually entertained by owners of a revival in the autumn, when the movement of the crops should be at its height, were not disappointed. The first signs of the revival appeared in the East, which, when the demand set in, proved to be very short of tonnage. In prewar years it had been customary for some owners to charter their vessels for employment in the eastern trade over considerable periods and when their work in the East had been done they were available for homeward loading. Possibly a good deal of this business is now carried on by the liner companies, and it is probable that only a relatively limited amount of tonnage had thus been dispatched in 1922 to the East with coal cargoes. In any case, in eastern trade, the supply of tonnage during the autumn could hardly keep pace with the demand for shipping to load homewards, and rates advanced considerably. The Far East took a substantial amount of tonnage in the autumn, principally for the shipment of beans and oil.

British Cargo Freight Index Number

Prepared by L. Isserlis, statistician for the chamber of shipping of the United Kingdom, and published in *The Statist*, London.

	1920	1921	1922
January	123.0	46.3	33.0
February	138.0	38.0	33.6
March	141.0	37.5	33.3
April	127.0	39.5	31.0
May	121.0	39.4	32.5
June	112.0	42.7	29.8
July	95.0	43.0	27.8
August	84.0	40.2	27.6
September ...	84.0	34.4	26.7
October	93.0	30.8	28.1
November ...	80.0	29.8	29.9
December	58.0	33.3	

Calculated in each case on the basis of 100 as representing the geometrical average in 1920.

Trend of Rates

The general movement of freights is indicated in the index number of shipping freights prepared by Dr. Isserlis, the statistician of the chamber of shipping of the United Kingdom. This index number takes account of the rates in 21 principal trades and since some trades are of more importance than others more component freights are employed in these trades thus producing a weighted index. As compared with an index number of 123 in January, 1920, the index number for January, 1922, was 33. In February the number, at 33.6 reached its maximum for 1922. There was some decline later, but at 29.9 the number for November showed an increase of 6.5 per cent on that for October and of 12.1 per cent on the figure for September. It was also slightly higher than the figure of 29.78 for November of last year. As compared with a time charter index number of 29.9 in January, the figure for November was 24.7. This represented a rise of 3.1 per cent as compared with the figure for October, this being the first increase since May, 1921. Although the index numbers show very heavy falls as compared with the level for 1920, they do reflect the improvement which set in during the concluding weeks of 1922.

For the liner companies the year 1922 will be notable for marked reductions in the passenger rates to and from India, Australia, New Zealand, and the Far East. For some time it had been known that the high charges were restricting traffic, but shipping managers maintained that the level of working costs precluded them from making any reductions in the passage rates. As indicating the reductions now in force, first-class "B" rate by the P. & O. company from London to Singapore was lowered from £124 to £98 and the corresponding rate from London to Japan was lowered from £150 to £124. The first-class "B" saloon fare from London to Sydney was reduced from £150 to £124 and the second-class fare from £115 to £86. Reductions in rates were made by all the principal lines in the eastern, far eastern and Australian trades, and in addition to the P. & O. line, by the Ellerman & Bucknall lines to India and the Far East, by the Orient and Aberdeen lines to Australia, and by the New Zealand Shipping Co. and the Shaw, Savill & Albion Co. to New Zealand. The rates were lowered in the first, second-class and third-class accommodation. The saloon rates are still substantially above the prewar standard, and it is probable that the lines will consider very carefully the desirability of making further reductions before long. The companies have to take into account the fact that their traffic depends not only on those who are compelled to travel but also on those who desire to do so from time to time and may be prevented by unduly high rates. Again the matter

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seems to be largely one of working costs.

In the autumn a revision of rates in the North Atlantic trade was announced, but, so far, except for a reduction by the Royal Mail Steam Packet Co. in its rates from the United Kingdom, to New York, no great changes have been introduced. Next year competition in the North Atlantic trade promises to be very keen, especially as some large new vessels of the German shipping lines are expected to be in service. It is known that the earnings of the shipping companies in the North Atlantic trade were unfavorably affected last year by the immigration restrictions in the United States.

Generally the shipping conditions at the end of the year suggest that owners and brokers may fairly look for some further improvement in 1923, at any rate, in cargo business. A hopeful sign has been the placing of a number of orders for cargo steamships by experienced owners in the closing weeks of 1922. They will have been influenced by the present shipbuilding prices, which are now far lower than they were and by the belief that employment will be forthcoming for the vessels.

A good proportion of the tonnage still laid up is known to be obsolete, or practically obsolete, and in these days of keen competition the most efficient types of vessels will be required for successful operation.

What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

SHIPBUILDING interest is naturally concentrated on new business, for which the trade has waited with so much anxiety for the past two years. The stagnation has been altogether without precedent, but every day brings additions to the orders placed, while the sign of returning confidence is shown in the increasing public favor with which shipping shares are regarded. Orders within the first half of December have been distributed more or less impartially between the Clyde, the Tyne, and the Tees so that quite a lot of shipyards are waking up. The much desired orders for tramp steamers are now coming forward, the total placed up to Dec. 18 being upward of 50.

One of the earliest tasks to which the new government set its hand was the fixing up of contracts for the two capital battleships intended to replace, under the Washington pact, the destroyed ships. The building of the hulls are entrusted to Armstrong, Whitworth & Co. Ltd. on the Tyne, and Cammell, Laird & Co. Ltd. at their Birkenhead yard on the Mersey. Both yards are well equipped for dealing with big work.

A few years ago it was considered £2,000,000 was quite an extravagant price for a battleship, but the general estimate is that on these contracts £10,000,000 will be spent in wages. Cammell Laird hope to launch the hull of their vessel in 1924. It is to be laid down at the new Tranmere yard on the slipway where H. M. S. HOWE and the Cunard liner SAMARIA were built. At least 150 war vessels have been built at Birkenhead by this firm.

The range of choice was narrowed by the fact that the warships are to be built to a new design calling for side compartments known as bulges giving the vessels a total beam of about 106 feet. There are only a few builders who could undertake such widths without previous enlargements of their yards. There was some soreness at Glasgow that a hull is not to be built on the Clyde but the premier has explained that the Glasgow tenders were much higher than those of other firms. Glasgow will have to be content with a share of the business for guns and arms.

* * * *

THE annual report covering the fiscal year ended July 31, 1922, of John I. Thorneycroft & Co., London, one of the largest marine engineering firms in England, shows a gross profit of £52,340 ($235,000). After allowing for directors' fees and bond interest, a net profit of £35,640 ($16,300) results, a decrease of £25,060 ($112,770) compared with of the previous year. A sum of £55,747 ($250,800) has been brought in, making an available surplus of £85,448 ($384,500) after the necessary provision for an interim dividend on the preferred stock. A 6½ per cent dividend will be paid on the participating preferred stock, leaving a balance of £60,758 ($273,400) to be carried forward. No dividend will be paid on the common stock.

This report covers a period of exceptional trade depression in the shipbuilding, motor vehicle, marine and stationary engine busnesses, whch in the main has had an adverse effect. Among the vessels finished during the past year, mention is made of eight commercial vessels, two special ferry steamers for Lancashire, and several fast naval power boats for foreign governments, including one for the United States navy. Dockyard repair work showed a satisfactory return.

* * * *

IN A LECTURE delivered before the Wolverhampton branch of the Birmingham Metallurgical society by D. Turner, London, a great deal of detail was given as to the use of fuel oil for ship propulsion. Incidentally, it was pointed out that the oil fields of Mexico have in recent years yielded the largest supply of fuel oil, and many experts anticipate they will eclipse the United States having a potential production of 1,825,000 barrels daily or 95,000,000 tons per annum. Tankers are loaded at Tuxpam in Mexico by means of submarine pipe lines discharging into vessels 1½ miles from the shore. Each ship is loaded and dispatched within 2½ days and the rate of loading is 10,000 tons per 24 hours.

A wealth of detail was given showing the saving in space and time by the substitution of oil for other fuels in ship propulsion. It was pointed out, also, that the furnace of a vessel burning oil could be readily altered to burn coal or *vice versa* when required, enabling vessels trading between countries rich in either fuel to change over to oil or fuel, according to the relative cheapness at different times.

* * * *

GENERAL Sir Ian Hamilton is strongly advocating the construction of a canal connecting the Forth with the Clyde. This is a very old project, the same suggestion having been made by no less historic a person than Charles II. From the naval point of view, the project appeals to admirals of the fleet since it would

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enable the vessels to pass securely between the North sea and the Atlantic. The estimated cost is £24,000,000. It would give work to 50,000 men and would take five years to complete. In the present state of public finances, no probability exists that much progress will be made with this scheme.

* * * *

COL. John M. Denny of Dumbarton, a prominent Clyde shipbuilder, died in a Glasgow nursing home following an operation. He was chairman of W. Denny & Bros. Ltd. and president of the Clyde Shipbuilding association. For some years from 1895 he represented Kilmarnock boroughs in parliament.

* * * *

THE ACCOUNTS of the Clyde lighthouses show a little improvement, the revenue for the year being £20,793 representing an increase over the previous year of £3,314. The gross revenue from shipping was equal to 85 per cent of the 1914 revenue as against 69 per cent in the preceding year.

* * * *

SHIPYARDS of Swan, Hunter & Wigham Richardson, Ltd., show a tonnage output during 1922 of 119,652 tons. Two vessels included above, the DUMANA, 8500 tons with 5800 indicated horsepower, and the ARNUS, 4200 tons and 2500 indicated horsepower, were engined with diesel engines at the firm's own works on the Clyde and Tyne respectively.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Jan. 11, 1923, on Future Loadings

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 100 lbs.	††Finished steel
Liverpool	2 Sh.	$0.35	$0.23	$0.19	$0.30	$0.60	$7.00T
London	2 Sh.	0.35	0.23	0.19	0.30	0.60	7.00T
Christiania	$0.18 to 0.20	0.35 to 0.40	0.47½	0.23 to 0.25	0.37½	0.80	7.00T
Copenhagen	0.18 to 0.20	0.35 to 0.40	0.47½	0.23 to 0.25	0.42½	0.85	7.00T
Hamburg	0.14	0.20	0.27½	0.19	0.37½	0.75	8.00T
Bremen	0.14	0.20	0.27½	0.19	0.37½	0.75	8.00T
Rotterdam	0.15	0.20 to 0.25	0.28	0.20	0.35	0.70	7.00T
Antwerp	0.13	0.27½	0.22½ to 0.28	0.19	0.35	0.70	6.50T
Havre	0.18	0.40	0.22½	0.23	0.40	0.75	8.00T
Bordeaux	0.18	0.40	0.37½	0.23	0.40	0.75	8.00T
Barcelona	0.20	0.55	0.40	7.00T	—16.00T—		7.00T
Lisbon	0.21	0.60	0.40	7.00T	—20.00T—		7.00T
Marseilles	0.20	0.55	0.50	5.60T	—20.00T—		7.00T
Genoa	0.19	0.60	0.35	0.30	0.40	0.80	7.00T
Naples	0.19	0.60	0.35	0.30	0.40	0.80	7.00T
Constantinople	0.23 to .25	15.00T	0.75	0.30	—20.00T—		8.00T
Alexandria	0.23 to .25	15.00T	0.75	0.30	—20.00T—		8.00T
Algiers	0.25	0.65	0.60	0.30	—16.00T—		8.00T
Dakar	.....	14.50T	.....	15.00T	—20.00T—		10.00T
Capetown	10.50T	17.00T	17.00T	12.50T	—20.00T—		11.25T
Buenos Aires	.....	20.00T	.....	.....	—20.00T—†		6.00T†
Rio de Janeiro	.....	21.00T	.....	.....	—21.00T—†		6.00T†
Pernambuco	.....	22.00T	.....	.....	—22.00T—†		8.00T†
Havana	0.17½*	0.37½*	.....	0.17½*	0.47*	0.94*	0.20*
Vera Cruz	.....	0.45	.....	0.20	0.52½	1.05	0.30
Valparaiso	.....	1.07	.....	0.70	0.45	0.80	12.00T
San Francisco	.....	0.40	.....	0.56	.....	.....	0.30
Sydney	.....	20.00T	.....	.....	20.00 to 25.00		11.50T
Calcutta	.....	16.00T	.....	.....	—16.00T—		10.00T

T—Ton. †Landed. ††Heavy products limited in length. *Extra charge for wharfage.

From North Pacific Ports to	Lumber Per m. ft.
San Francisco	$6.50 to 7.00
South California	7.50 to 8.00
Hawaiian Islands	10.00 to 10.50
New Zealand	13.50 to 15.00
Sydney	13.50 to 15.00
Melbourne-Adelaide	14.00 to 15.00
Oriental Ports	10.00 to 11.50
Peru-Chile	14.00 to 18.00
South Africa	19.00 to 20.00
Cuba	17.00 to 18.00
United Kingdom	80s to 90s
United Kingdom (ties)	70s to 80s
Baltimore-Boston range	15.00 to 17.00
Baltimore-Boston range (ties)	14.00 to 16.00
Buenos Aires	17.00
	Flour and Wheat
Oriental Ports	$ 5.00
U. K. and Continent	32/6 to 37/6T
Scandinavia	37/6 to 42/6T
Mediterranean	37/6 to 42/6T
West Coast Italy	35s to 40sT
	Steel
Oriental Ports	$5.00T
	Cotton
Oriental Ports	35c to 50c per cwt.
	Apples
United Kingdom	90 cents per box
	Copper
Oriental Ports	$5.00
	Box Shooks
Oriental Ports	$10 measurement ton
	Metal Junk
Oriental Ports	$10
	Scrap Copper
Oriental Ports	$5
	Salt Herring
Oriental Ports	$8 measurement ton

Principal Rates To and From United Kingdom

	s	d
Grain, River Plate to United Kingdom	25	0
Coal, South Wales to Near East	13	6
Coal, Newcastle to France	6	6
Coal, South Wales to Buenos Aires	14	6
Iron ore, Bilbao to Middlesbrough	7	3
General British market, six months time charters, per ton per month	4	6

Bunker Prices

At New York

		Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Jan.	9, 1922	$5.50 @ 5.90	$1.25	5.50 cents
April	6	5.30 @ 5.90	1.16½	4.75 cents
July	1	8.10	1.26½	4.75 cents
Oct.	13	8.55	1.45	5.50 cents
Dec.	12	7.90	1.45	4.75 cents
Jan.	11, 1923	7.90	1.50	4.75 cents

At Philadelphia

		Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Jan.	9, 1922	$5.10 @ 5.35	$1.50	5.00 cents
April	10	5.90 @ 6.25	1.05	4.25 cents
July	1	8.00	1.15	4.25 cents
Oct.	13	8.30	1.47	5.00 cents
Dec.	12	7.50	1.51	5.10 cents
Jan.	9, 1923	7.30 @ 8.00	1.57½	5.00 cents

Other Ports

Boston coal, per ton	$9.79
Boston, oil, f. a. s., per barrel	$1.50
Hampton Roads, coal, per ton	9.00
Seattle, coal, per ton	7.50 to 8.50
Cardiff, coal, per ton	19s
London, coal per ton	22s
Antwerp, coal, per ton	22s

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Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name of Vessel	Date	Nature	Place	Damage Resulting
A. A. Augustus	Dec. 9	Grounded	Detroit River	Jettis. cargo
Alm	Dec. 5	Disabled	New York	Pipe burst
Auguste LeBlond	Dec. 7	Disabled	At sea	Not stated
Amalienborg	Dec. 11	Collision	River Sohelot	Not stated
Athelmere	Dec. 24	Hurricane	At sea	Jettis. cargo
Anahuac	Dec. 21	Disabled	Fall River	Bridge dam.
Annie L. Spindler	Dec. 29	Storm	Race Point	Total loss
Alice M. Colburn	Jan. 3	Storm,on rocks	Off Coolidges Pt.	Breaking up
Arawana	Jan. 1	Ashore	West Beach	Badly dam.
Anna R. Heidritter	Dec. 30	Storm	At sea	Lost part of d'kl'd.
American Eagle	Jan. 4	Collision	Buttermilk Chan'l	Damaged
Banuco	Dec. 5	Leak. badly	At sea	Jet. oil cargo
Bouker (scow)	Dec. 11	Collision	New York	Heavy to bow
Belvidere	Dec. 12	Hvy. weather	At sea	Deck dam.
Bristol City	Dec.	Collision		Not stated
Bethelridge	Dec. 12	Grounded	Pensacola Bay	Not stated
Buena Vesta	Dec. 19	Leak, gr'd'd	Shrewsbury River	Jettis. cargo
Bradburn	Dec. 27	Not stated	Stornoway	Deck dam.
British Marshal	Dec. 30	Heavy sea	Foynes	Steerer dam.
Bergsdalen	Jan. 1	Struck obst.	At sea	Slight
Bellingham	Jan. 9	Disabled	At sea	Steerer lost
Canadian Gunner	Dec. 4	Fire	St. Johns	Hvy. to car.
Cragness	Dec. 5	Heavy sea	Atlantic	Rudder hd. gone
Coldwater	Dec. 11	Collision	Tybee Roads	Hull dam.
Chicago Maru	Dec. 16	Fire	San Pedro	To cargo
Colonel	Dec. 14	Grounded	Bar Point	Undamaged
Charles O. Jenkins	Dec. 17	Grounded	Lake St. Clair	Jettis. cargo
Caronia	Dec. 26	Hurricane	Halifax	Not stated
Cornell	Dec. 26	Not stated	Lake Erie	Total loss
Commercial Sport	Dec. 21	Disabled	Off Romer	Fuel oil froz.
Colonia	Dec. 15	Driven ashore	Near St. John	Total loss
Commercial Traveler	Dec. 26	Grounded	Pea Patch Island	Not stated
Chaudiere	Dec. 30	Ashore	Bermuda	Not stated
Clyne Rock	Dec. 6	Collision	Strait of Dover	Stem crackd
Coelleda	Dec. 12	Collision	Hampton Roads	Slight
Cacique	Jan. 1	Storm	At sea	To crgo
Cricket	Dec. 25	Storm	At sea	Lock deckld
De La Salle	Dec. 11	Collision	River Sohelot	Not stated
Dorothy	Dec. 17	Leak	Bridgeport	Sank(raised)
Dakar Maru	Jan. 6	Col., disabled	At sea	Not stated
Erie	Dec. 11	Not stated	Nr. Crescent, N.Y.	Sank
Eastern Glade	Dec. 11	Fire	Off Cape Verde Is.	To cargo
Emily	Dec. 9	Collision	Erie Basin	Damaged
Emperor	Dec. 16	Grounded	Nr. Bar Point	Not stated
Esther K.	Dec. 16	Fire	Off Cooper's Pt.	To donk. eng. room
Effingham	Dec. 22	Hurricane	Falmouth	Leaking
Eibergen	Dec. 22	Disabled	Off Lowestoft	Prop. blad's gone
Edgefield	Dec. 24	Grounded	Beaumont	Jettis. cargo
Esther	Jan. 2	Disabled	Philadelphia	Donk. eng. disabled
Elvenes	Dec. 27	Explosion	Botwood	Not stated
Fiore	Dec. 15	Disabled	Foochow	Masts gone
Faro	Dec. 17	Disabled	St. Thomas	Prop. lost
France Maru	Dec. 16	Fire	Galveston	In bunkers
Fluor Spar	Jan. 3	Water in hold	Bermuda	To cargo
G. J. Cherry	Dec. 12	Disabled	Nassau	Leaking
Gyp	Dec. 17	Coll. with bridge	Sheerness	Damaged
Gordon E. Fudge	Dec. 21	Gale, aban.	At sea	Burned
George Washington	Dec. 6	Collision	Strait of Dover	Unknown
Glen Ridge	Dec. 12	Collision	Hampton Roads	Slight
Glyndon	Jan. 3	Grounded	Staten Island	Not stated
Gertrude Parsons	Jan. 4	Ashore	Digby	Heavy
Harvester	Dec. 5	Grounded		Not stated
Harrison T. Beacham	Dec. 2	Storm	Mobile	Leaking
Harry A. M'Lennan	Dec. 2	Heavy sea	At sea	Lost deckld.
Hannover	Nov. 26	Collision	Saigon	Undamaged
Henrietta Simmons	Dec. 10	Heavy sea	Cape Cod Canal	Heavy
Hamilton	Dec. 14	Collision	Off Liberty	Considerable
Holsatia	Jan. 7	Stranded	Near Carysfort Light	Undam.
J. J. H. Brown	Dec. 13	Ashore	Bois Blanc Island	Tank punc.
J. J. Barlum	Dec. 13	In ice	Lime Island	Not stated
John Tracy	Dec. 5	Ashore	Off Shooters Is.	Not stated
Jonancy	Dec. 5	Collision	Hell Gate	Damaged
Jeff Davis	Dec. 11	Collision	Tybee Roads	Not stated
Janeta	Dec.	Collision		Stem twist'd
Janus	Dec. 20	Fire	Brooklyn	Slight
Jeanette Kayser	Dec. 29	Heavy sea	Hamburg	Forepeak leak.
Jean	Dec. 28	In ice	Bay of Islands	Not stated
James Tuft	Jan. 5	In tow	Puget Sound	Waterlogged
Janus	Jan. 8	Disabled	Off Tompkinsville	Listing
Kermit	Dec. 9	Collision	Erie Basin	Not stated
Kentuckian	Dec. 25	Grounded	Columbia River	Slight
Lituania	Dec. 17	Ashore	Island of Bornholm	Not stated
Londonier	Dec. 24	Hurricane	Queenstown	Machy dam.
Lorentz W. Hansen	Dec. 27	Hurricane	River Mersey	Bridge gone
Lavada	Dec. 18	Collision	Houston Ship Channel	To eng. & prop.
Lizzie Vance	Dec. 31	Disabled	Guam	Leak. badly
London Corporation	Jan. 1	Heavy sea	At sea	Davits broke
Munsomo	Dec. 8	Disabled	Balboa	Leaking
Manhattan	Dec. 11	Collision	New York	To port side
Modena	Dec.	Heavy sea	At sea	Lost part of deckl'd.
Manchester Spinner	Dec. 13	Ashore	Long Island	Slight
Maclean Odan	Dec. 13	Fire	Lunenburg	Burned foremast
Mexico	Dec. 14	Collision	Off Liberty	Hole in side
Mongolia	Dec.	Grounded	New York	Not stated
Miriam H.	Dec. 5	Ashore	Wabana	Total wreck
Melpo	Dec. 18	Disabled	Off Azores Islands	Steerer broke
Mary E. O'Hara	Dec. 26	Fog, ashore	Point Allerton	Not stated
Munmotor	Dec. 28	Gale	At sea	Slight
Moldegaard	Jan. 9	Disabled	Sandy Hook	Machy. & rud.
Mercier	Jan. 6	Grounded	Red Hook Flats	Not stated
Modica	Dec. 25	Heavy sea	At sea	Anchors lost
Natirar	Dec. 20	Ashore	Near Premo	Not stated
Nordhavet	Dec. 29	Fire	Santiagomde, Cuba	To cargo
Niederwald	Jan. 9	Disabled	Falmouth	Blade lost
Oteric	Dec. 11	Ashore	Off California	Broke in two
Ontario No. 1	Dec. 17	Grounded	Coburg Harbor	Not stated
Oplano	Dec. 31	Disabled	New York	Cir. pump broke
Philip T. Hodge	Dec. 5	Heavy seas	At sea	Lost pulp wood
Pennsylvania	Dec. 12	Fog, ashore	River Gironde	Undam.
Palma	Dec. 26	Disabled	St. Vincent	Steererbroke
Propeller	Dec. 18	Collision	Houston Channel	Bow stove in
Paraguay	Dec. 31	Disabled	Key West	Boil. dam.
Penrhos	Jan. 1	Grounded	Ship Island Bar	Undam.
Portuguese Prince	Jan. 2	Not stated	At sea	To cargo
Penn	Jan. 8	Ashore	Block Island	Full of water
Rion	Dec. 14	Disabled	Gibraltar	Rudder dam
Rose Ferlita	Dec. 20	Disabled	At sea	Lost sails
Ripple	Dec. 18	Collision	South Channel	Leaking
Steelore	Dec. 10	Grounded	Off St. George, SI	Not stated
Saguache	Dec. 11	Collision	New York	Not stated
Sweethope	Dec. 13	Ashore	Dog Keys	Not stated
Seth W. Smith	Dec. 13		Off Whitehead	Not stated
Salvatrice	Dec. 17	Disabled	Boston	Leaking
Serbino	Dec. 25	Disabled	New York	Steerer gone
Stimson	Dec. 29	Heavy sea	Key West	Lost sails
Seaboard	Jan. 3	Grounded	City Island	Not stated
Satsuma	Jan. 1	Disabled	Astoria	Steerer dis.
Sheperd King	Dec. 28	In ice	Bay of Islands	Not stated
Snetind	Jan. 7	Sails gone	Off Peaked Hill Bars	Leaking
Thunder Bay	Dec. 14	Ashore	Morgan's Point	Heavy
Tamesi	Dec. 9	Explosion	Galveston	Not stated
Tulsa	Dec. 15	Fire	Off Charleston	Not stated
Truro Queen	Dec.	Heavy sea	At sea	Lost foresail
Teesbridge	Dec. 13	Gales	At sea	To deck and steerer
Tourist	Dec. 21	Held in ice	Off Ballast Island	Not stated
Tudorstar	Dec. 23	Disabled	Clyde River	Steererbroke
Unita	Dec. 12	Grounded	Off Panama	Damaged
Verentia	Dec. 13	Windlass broke	New York	Slight
Venusia	Dec. 26	Hurricane	Falmouth	Machy. dam
Valacia	Dec. 29	Gale	At sea	Slight
W. G. Pollock	Dec. 13	In ice	Lime Island	Not stated
West Quechee	Dec. 10	Disabled	New York	Machy. trouble
West Segovia	Dec. 15	Fire	New Orleans	Not stated
Wales Maru	Dec. 9	Grounded	Off Tinicum Island	Jettis. cargo
Winnifred	Dec. 9	Sinking	Off St. Pierre	Not stated
Willsolo	Dec. 29	Grounded	Below Baltimore	Not stated
West O'Rowa	Jan. 6	Stranded	Nagoya	Jettis. caro
Zebedee E. Cliff	Dec. 9	Grounded	Ship Channel	Not stated

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Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922..	397	1,798,423	473	1,819,341
November	426	1,626,068	463	1,805,798
October	452	1,846,327	467	1,848,637
September	519	1,985,981	542	2,104,884
August	515	1,772,837	508	1,865,798
July	509	1,928,541	520	1,977,690
June	486	1,718,879	551	2,070,048
May	524	1,769,601	496	1,759,780
April	454	1,651,584	473	1,758,169
March	462	1,708,727	484	1,829,016
February	414	1,548,412	391	1,533,163
January	370	1,230,000	396	1,436,614
December, 1921.	398	1,372,663	436	1,604,960

Seattle

(Inclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	201	560,159	198	564,367
November	138	374,871	139	374,871
October	164	417,901	148	406,498
September	159	375,340	159	382,079
August	162	396,363	153	387,908
July	140	373,211	137	371,526
June	139	384,290	137	354,702
May	138	357,583	150	361,835
April	129	328,172	154	365,057
March	198	508,760	202	515,606
February	159	478,849	147	417,425
January	174	479,514	177	509,508
December, 1921.	183	528,191	180	517,996

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	74	77,623	78	85,839
November	69	71,740	70	71,705
October	61	67,755	64	77,225
September	57	64,645	59	62,676
August	65	69,962	61	65,883
July	67	80,673	67	85,336
June	60	73,308	58	73,842
May	89	107,629	82	101,318
April	77	81,917	81	86,471
March	97	78,984	92	76,531
February	84	67,080	78	68,137
January	77	69,850	77	72,321
December, 1921.	76	73,276	74	70,169

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922..	78	209,962	63	167,736
November	75	221,130	78	241,326
October	80	205,137	73	202,326
September	103	261,963	74	224,079
August	104	273,123	76	222,478
July	116	307,058	84	248,337
June	103	282,251	83	233,964
May	117	310,117	80	234,220
April	94	245,785	63	197,807
March	107	288,295	79	257,149
February	94	240,663	62	189,140
January	86	243,546	67	211,468
December, 1921..	89	256,660	90	285,894

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	211	543,884	222	573,111
November	220	598,306	219	599,150
October	239	630,306	235	625,605
September	212	555,017	223	571,299
August	249	625,819	250	629,150
July	227	570,709	236	601,740
June	253	596,752	234	587,483
May	236	632,495	230	610,916
April	221	565,559	225	594,842
March	235	643,251	258	716,568
February	197	582,189	201	576,973
January	225	621,483	217	603,995
December, 1921.	208	576,354	271	788,172

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	48	144,019	48	136,247
November	22	45,567	21	46,755
October	27	60,114	22	49,594
September	32	68,125	27	57,609
August	28	42,746	28	47,459
July	19	39,950	20	39,571
June	11	16,601	15	21,765
May	16	21,380	10	22,477
April	14	51,228	18	62,091
March	23	81,938	20	77,044
February	23	73,634	24	75,625
January	21	64,885	21	67,309
December, 1921.	29	92,777	32	99,527

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922..	19	52,716	40	137,081
November	6	21,036	38	118,738
October	17	44,423	46	149,670
September	5	22,051	45	132,751
August	15	43,887	51	158,879
July	22	62,986	55	158,254
June	22	73,791	56	175,961
May	21	61,513	73	193,599
April	18	59,180	83	232,485
March	29	77,775	79	235,809
February	24	66,156	72	192,640
January	22	78,412	53	152,957
December, 1921.	24	83,609	64	184,012

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	138	383,366	61	181,975
November	130	357,264	59	123,255
October	149	408,855	91	217,899
September	193	511,027	101	248,328
August	192	449,871	116	203,774
July	159	324,795	94	229,492
June	137	169,015	94	161,888
May	133	251,304	104	192,231
April	71	138,683	103	270,499
March	85	241,289	56	135,671
February	76	218,853	58	153,350
January	70	185,175	42	108,423
December, 1921.	94	239,170	61	134,039

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. Ships	Net Tonnage	—Clearances— No. Ships	Net Tonnage
November, 1922.	14	41,665	15	40,606
October	19	52,065	19	46,054
September	26	68,878	26	73,540
August	22	63,662	22	59,974
July	23	66,833	23	61,655
June	11	24,870	20	53,367
May	11	20,536	16	40,181
April	8	20,485	15	42,591
March	6	12,845	19	47,946
February	9	17,568	15	40,622
January	6	11,561	9	23,601
December, 1921.	4	8,876	14	43,281
November	10	19,543	16	44,187

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922..	54	187,648	68	234,385
November	42	154,024	42	154,280
October	59	159,855	69	261,687
September	52	163,697	65	233,079
August	65	221,288	68	219,326
July	64	194,586	55	191,574
June	51	182,219	47	161,761
May	50	170,506	56	191,858
April	50	174,713	54	190,928
March	52	185,391	58	188,930
February	47	158,210	54	184,296
January	52	152,819	52	167,007
December, 1921..	46	183,468	62	211,542

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	66	123,746	56	119,821
November	68	147,775	53	130,769
October	59	143,207	52	110,398
September	66	121,037	51	85,801
August	60	112,431	65	137,552
July	79	152,475	73	138,543
June	77	153,357	76	141,413
May	61	109,793	55	114,691
April	61	144,237	62	123,238
March	73	136,937	57	110,363
February	54	122,606	59	117,172
January	71	147,866	64	136,242
December, 1921	85	194,757	87	216,233

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. Ships	Net Tonnage	—Clearances— No. Ships	Net tonnage
December, 1922.	64	214,952	79	260,159
November	56	174,964	87	304,352
October	59	156,587	85	260,702
September	48	144,403	56	187,724
August	59	180,814	63	203,194
July	52	165,276	50	186,201
June	61	193,016	61	200,957
May	60	196,575	52	200,787
April	64	190,675	61	210,853
March	66	155,728	56	166,298
February	45	134,229	48	138,482
January	53	141,172	65	182,442
December, 1921	74	220,988	85	255,851

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922..	110	322,948	104	380,616
November	114	361,162	132	403,593
October	97	289,239	101	304,431
September	107	333,387	112	298,444
August	110	326,163	106	300,080
July	103	320,104	90	280,394
June	99	280,002	118	333,877
May	117	350,494	103	282,285
April	98	277,582	110	319,103
March	107	323,515	125	362,451
February	93	294,309	103	334,507
January	72	225,800	85	274,080
December, 1921.	95	281,373	102	312,528

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	133	132,114	76	83,537
November	110	111,803	111	112,934
October	117	115,548	138	94,522
September	61	127,969	96	133,561
August	52	143,931	43	117,758
July	44	125,139	48	138,275
June	48	109,261	38	90,915
May	47	141,219	55	174,644
April	53	161,709	45	138,927
March	75	172,471	59	139,424
February	76	105,243	63	108,207
January	88	149,622	101	125,795
December, 1921.	94	161,393	81	137,450

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. Ships	Net Tonnage	—Clearances— No. Ships	Net Tonnage
December, 1922.	98	266,774	107	291,126
November	98	266,706	105	283,881
October	109	290,048	109	267,006
September	111	313,168	108	298,452
August	102	256,671	103	259,170
July	95	254,553	88	233,744
June	104	300,517	110	319,637
May	85	226,853	88	230,176
April	89	245,702	90	244,402
March	99	264,306	105	283,361
February	85	232,786	82	220,175
January	85	230,682	90	244,363
December, 1921.	92	266,763	94	279,862

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Marine Business Statistics Condensed

Port Traffic Record

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1922....	65	72,192	63	215,043
October	55	57,106	53	168,254
September	43	46,600	43	97,005
August	35	40,503	32	63,281
July	29	30,909	32	73,299
June	38	48,938	36	74,798
May	44	45,108	42	134,046
April	42	61,751	47	98,825
March	48	45,312	40	105,309
February	28	27,173	30	86,028
January	32	53,779	31	92,096
December, 1921...	22	42,359	21	27,001
November	23	30,705	27	46,519

Port Arthur, Tex.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	59	210,778	65	218,274
November	42	143,551	47	154,010
October	68	227,039	66	217,502
September	53	158,181	57	168,681
August	69	227,941	70	224,654
July	88	296,956	82	270,263
June	81	271,752	87	285,633
May	90	303,623	88	292,595
April	90	282,288	101	313,829
March	91	318,679	87	269,369
February	73	233,148	81	250,138
January	82	261,439	77	261,604
December, 1921.	106	359,401	104	339,605

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1922.	6	23,609	8	29,871
November	11	47,565	10	31,470
October	9	31,293	9	31,232
September	30	84,037	13	40,223
August	18	61,741	11	38,649
July	10	19,279	7	22,228
June	10	31,095	7	17,423
May	14	49,985	13	37,000
April	9	24,854	7	31,049
March	12	45,966	8	34,272
February	13	53,367	11	46,372
January	11	46,093	12	50,449
December, 1921.	8	26,053	16	50,847

Soo Canal Report

Complete comparative figures follow showing the traffic through the Soo canal in each of the past two years by commodities:

	To Jan. 1, 1923	To Jan. 1, 1922
EASTBOUND		
Lumber, M. ft. B. M....	214,112	206,306
Flour, barrels	9,382,613	10,217,305
Wheat, bushels	275,615,288	197,715,010
Grain, bushels	119,225,398	95,694,264
Copper, net tons.....	57,941	31,533
Iron ore, net tons.....	42,156,638	22,585,503
Pig iron, net tons.....	21,934	526
Stone, net tons.....	28,025	24,910
Gen'l merchandise, net tons	305,543	98,124
Passengers, number	29,426	33,015
WESTBOUND		
Coal, soft, net tons.....	8,790,571	12,507,027
Coal, hard, net tons.....	670,447	2,256,128
Iron ore, net tons.....	70,700	9,820
Mfg. iron and steel, net tons	46,566	38,509
Salt, net tons.....	73,685	62,313
Oil, net tons.....	191,182	301,633
Stone, net tons.....	628,738	468,537
Gen'l merchandise, net tons	575,146	502,039
Passengers, number	29,617	33,606
SUMMARY		
Vessel passages, number.	17,383	12,847
Registered tonnage, net..	52,595,857	32,184,240
Freight:		
Eastbound, net tons.....	55,020,223	32,113,248
Westbound, net tons....	11,047,035	16,146,006
Total freight, net tons...	66,067,258	48,259,254

Pittsburgh Traffic Drops

A decline of about 470,000 tons is shown in the total traffic on the rivers in the Pittsburgh district in December compared with November, according to the monthly report of the United States engineer. The December total is 2,523,707 tons against 2,993,629 tons in November and 3,059,824 tons in October. Coal, which is easily the dominant cargo in the district, naturally accounts for the main fluctuations, the drop in December being 266,886 tons. Gravel shipments dropped 102,831 tons and sand 93,809 tons. Iron and steel shipments, which are relatively new in importance, declined from 55,746 tons in November to 44,300 tons in December. The November total for iron and steel had set a new high record. The record by rivers and commodities for December follows:

Commodity	Allegheny	Monon-gahela	Ohio	Total
Coal	88,900	1,660,206	249,451	1,998,557
Coke	.....	29,720	.....	29,720
Gasoline	608	1,508	540	2,656
Gravel	55,870	45,450	94,415	195,735
Iron and steel	1,100	24,350	18,850	44,300
Packet cargo.	.....	.....	4,277	4,277
Sand	59,053	67,400	112,138	238,591
Unclassified..	200	5,539	4,132	9,871
Total	205,731	1,834,173	483,803	2,523,707

1921 San Francisco Port Traffic

Port traffic records of San Francisco, as previously reported in these pages, have included domestic trade. Most of the other port records include only foreign trading tonnage. This month, through the courteous assistance of J. M. Daily, manager of the marine department of the San Francisco chamber of commerce, the figures for that port have been put upon the same basis as the other ports. The following table shows the records for foreign trading tonnage at San Francisco through 1921, the totals for 1922 being carried in the general table on the facing page:

(Exclusive of Domestic)

Month	Entrances No. ships	Net tonnage	Clearances No. ships	Net tonnage
January	48	127,109	60	169,854
February	59	171,400	51	177,915
March	63	164,738	58	171,042
April	58	186,208	64	187,194
May	66	203,357	40	130,120
June	41	115,635	54	179,215
July	66	206,271	57	206,319
August	54	170,292	59	196,806
September	52	169,468	60	165,559
October	48	173,049	64	238,959
November	45	148,537	54	257,857
December	46	183,468	62	211,542

Record of Traffic Through Panama Canal

		Atlantic to Pacific traffic —Panama Canal— No. of ships	Net tonnage	Tons of cargo	Pacific to Atlantic traffic —Panama Canal— No. of ships	Net tonnage	Tons of cargo	Total traffic through canal —Panama Canal— No. of ships	Net tonnage	Tons of cargo
1922										
November	American	65	324,783	234,500	55	273,293	416,515	120	598,076	651,015
	Foreign	83	370,180	266,878	91	369,024	508,967	174	739,204	775,845
	Total	148	694,963	501,378	146	642,317	925,482	294	1,337,280	1,426,860
October	American	70	328,229	264,171	51	250,606	385,196	121	578,835	649,367
	Foreign	89	384,223	300,904	84	347,334	495,592	173	731,557	796,496
	Total	159	712,452	565,075	135	597,940	880,788	294	1,310,392	1,445,863
September	American	54	260,249	226,741	53	235,008	315,898	107	495,257	542,639
	Foreign	72	322,167	241,095	61	252,986	354,454	133	575,153	595,549
	Total	126	582,416	467,836	114	487,994	670,352	240	1,070,410	1,138,188
August	American	58	261,613	257,674	48	236,669	305,838	106	498,282	563,512
	Foreign	83	350,249	299,087	68	235,602	303,351	151	585,851	602,438
	Total	141	611,862	556,761	116	472,271	609,189	257	1,084,133	1,165,950
July	American	52	250,378	246,471	55	272,868	335,154	107	523,246	581,625
	Foreign	76	323,853	295,941	68	280,772	333,534	144	604,625	629,475
	Total	128	574,231	542,412	123	553,640	668,688	251	1,127,871	1,211,100
June	American	57	256,060	269,098	45	205,063	211,373	102	461,123	480,466
	Foreign	78	338,136	317,284	48	171,454	179,728	126	509,590	497,012
	Total	135	594,196	586,377	93	376,517	391,101	228	970,713	977,478
May	American	59	285,265	343,913	49	226,356	264,626	108	511,621	608,539
	Foreign	75	309,448	329,485	60	211,747	220,483	135	521,195	549,968
	Total	134	594,713	673,398	109	438,103	485,109	243	1,032,816	1,158,567
April	American	47	220,055	260,442	48	223,913	238,420	95	443,968	498,462
	Foreign	74	300,633	301,991	61	230,232	245,194	135	530,865	547,585
	Total	121	520,688	562,433	109	454,145	483,614	230	974,833	1,046,047
March	American	57	256,613	239,696	46	215,547	219,569	103	472,160	459,265
	Foreign	81	329,428	342,256	50	174,223	158,568	131	503,651	500,824
	Total	138	586,041	581,952	96	389,770	378,137	234	975,811	960,089
February	American	46	199,564	186,486	42	192,931	193,643	88	392,495	380,129
	Foreign	68	288,441	256,339	56	205,599	201,606	124	494,040	457,945
	Total	114	488,005	442,825	98	398,530	395,249	212	886,535	838,074
January	American	47	208,770	206,633	38	169,575	153,649	85	378,345	360,282
	Foreign	78	304,994	286,958	47	163,177	160,058	125	468,171	447,016
	Total	125	513,764	493,591	85	332,752	313,707	210	846,516	807,298
1921										
December	American	44	198,506	163,744	43	198,528	179,441	87	397,034	343,185
	Foreign	91	377,163	353,366	61	243,047	256,502	152	620,210	609,868
	Total	135	575,669	517,110	104	441,575	435,943	239	1,017,244	953,053

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1922 Insurance Profits Higher

Last Year's Business Proved Much Better Than Early Forecasts — Prospects Encouraging for New Year

ALTHOUGH marine insurance companies have not yet filed their annual statements with the insurance departments, little doubt exists that business during the year just passed will compare favorably with the previous 12 months. Premium income will probably exceed that of 1921. Losses have been heavy but have been offset to a certain extent by the drop in repair costs. Marine underwriters, who have been studying the trend of the business, are of the opinion that conditions are slowly returning to the prewar level and the wise marine insurance man should compare his underwriting exhibit with normal, transactions and not the peak business under war stress. The expense of acquiring and handing business has been a heavy load on the shoulders of underwriters and during the past 12 months many executives have had their salaries reduced and help, found not absolutely essential, has been let go.

When the statements of 1922 are published, it will probably be found that the companies that have pursued a conservative policy of selecting risks and have not been induced to take premiums regardless of cost, will show a fair underwriting profit. One company, noted for its careful management and its stringent requirements will show a handsome profit, which will go to prove that careful underwriting in the marine field, as in other lines, is fruitful.

In view of the upset conditions in the shipping business relatively few failures or instances of companies absorbed by others have taken place. It was predicted by several prominent marine underwriters at the beginning of 1922 that the year would see a surprising number of American companies abandoning the field. This prophecy has failed to materialize. Not more than half a dozen companies have ceased business.

One of the notable achievements in the marine insurance world accomplished during the year just ended was the preparation of a standard marine insurance policy. While the contract is not yet generally in use, it has been approved and 1923 should see its adoption.

The theft and pilferage situation, which caused many companies to stop writing this coverage at the beginning of 1922 has been considerably improved with the result that some of the companies that withdrew are again furnishing this insurance after carefully scrutinizing the risk.

Rate-cutting to swell the premium income has been a black spot in the record of 1922. A few companies resorted to this practice and were successful in winning the business away from their competitors. Much of the business obtained this way, however, was not desirable, with the natural result that companies which resorted to rate slashing will probably show a heavy loss ratio.

Marine underwriters generally are optimistic regarding the new year. The 12 months just past were a period of readjustment which brought many surprises. New 1923 seems to be a more normal infant.

* * *

Unusual Policy Covers Coffin Shipment

AN UNUSUAL policy has been written by a New York agency covering a shipment of 400 coffins containing the bodies of that number of Chinamen being returned to China. The policy provides that the persons handling the shipment will be reimbursed for loss or damage to the coffins. The bodies are of Chinamen who have died in the United States during the past 20 years. They were collected by Chinamen in this country and were shipped from Boston. The bodies are being returned to China because of an ancient tradition that the soul of a departed will not rest in Buddha's heaven until the body is laid to perpetual rest in China itself. The coffins were insured because those engineering the shipment will not be reimbursed unless the shipment is received intact.

* * *

Shipping Board Out of Insurance Society

DISCORD which has been brewing between the shipping board and the American Steamship Owners' Mutual Protective and Indemnity association has culminated in an announcement by the shipping board that effective Feb. 20 the fleet of government owned vessels that have been a considerable part of the association will withdraw. Just what is responsible for the breach has not been determined and beyond the curt statement that it is due to reasons termed "highly technical," shipping board officials have refused to give any further explanation. Insurance men are of the opinion that the government has under consideration a plan to set up its own insurance organization to furnish the required protection. Rumors that the shipping board has had the intention to handle its own insurance have been heard for many months and it is well known that several shipping board officials are in favor of it.

The association was organized in 1917 for the purpose of protecting and furnishing cover to shipowners against claims for loss or damage arising from such causes as are not usually provided against in ordinary marine insurance policies. The association furnishes cover against such hazards as sickness among crews, immigration fines, etc. About $7,000,000 was paid out in claims by the association in 1921, the membership of which numbers about 90 per cent of the privately owned tonnage under the American flag. Many reasons are advanced for the action of the shipping board, one of them being that officials are curtailing expenses to a minimum.

* * *

Newest Model Bill Meets General Approval

THE most recent model marine insurance bill for individual states which has been in the hands of a special committee of the state commissioners, has been reported by the committee and received the endorsement of the National Convention of Insurance Commissioners. At the annual gathering of that body in New York recently, the commissioners went on record as being heartily in favor of the measure which is aimed to remove some of the obstacles in the path of domestic marine insurance companies. The bill will be introduced with the support of the superintendent of insurance in the state of New York during the next few weeks and will probably be presented simultaneously in other states, notably Missouri.

The only clause in the bill that was protested by the national convention was one that provided for the levy of a tax upon unauthorized insurance. It has not yet been decided what sum

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should be adopted to even up foreign and domestic competition.

At the final public hearing of the bill, several insurance company officials requested that the definition of marine insurance be simplified. The following definition was drawn up and proved satisfactory to all concerned:

Whenever used in this act, the terms "marine insurance" and "marine business" mean insurance or reinsurance against any and all kinds of loss or damage to:

Vessels, craft, aircraft, cars, automobiles and vehicles of any kind (excluding automobiles operating under their own power or while in storage not incidental to transportation) as well as all goods, freights, cargoes, merchandise, effects, disbursements, profits, moneys, bullion, precious stones, securities, choses in action, evidences of debt, valuable papers, bottomry and respondentia interests and all other kinds of property and interests therein, in respect to, appertaining to or in connection with any and all risks, or perils of navigation, transit or transportation, including war risks, on land or in the air, or while being assembled, packed, crated, baled, compressed or similarly prepared for shipment, or while awaiting the same, or during any delays, storage, transshipment, or reshipment incident thereto, including marine builders' risks and all personal property floater risks, and

Person and property in connection with or appertaining to a marine, inland marine, transit or transportation insurance including liability for loss of or damage to either, arising out of or in connection with the subject of such insurance.

* * *

Danish Insurance Firm Suspends Payments

ANOTHER failure has been added to the list of foreign insurance companies organized during the war to transact marine business. The Danske Lloyd, Copenhagen, Denmark, is the latest company to hit a reef. According to A. H. Thompson, American counsel, payments have been suspended while an investigation is made to determine whether or not it will be possible for the company to continue in business.

The Danske Lloyd was organized in 1917 when prospects for a marine company seemed to be bright. It was one of a number formed with the hope of capturing the business that had been going to German companies and satisfying the increased demand for marine insurance.

Take Up Claims Against Norwegian Company

THE manager of a domestic marine insurance office has received by mail from abroad a court order regarding claims against the Norske Lloyd which went into the hands of a receiver in November. The notice reads that anyone having a claim against the company must give notice thereof in writing and send documents, original or in copy, upon which claims are based. A meeting of creditors is to be held in Christiania on Feb. 7.

* * *

Court Admits New Claim to General Average

A RULING of interest has been handed down recently by the United States circuit court, whereby it is held that general average contributions can be required of chartered vessel owners for the expense of removing coal stiffening which has become so heated by the weather as to constitute a real peril to the ship. The court held that overheating of stiffening is an unforeseen event and one of great danger to ships and that owners should be held responsible for general average when sacrifices are made to rescue endangered property. In the case before the court, it was stated that the expenses incurred were provided for by a clause in the charter parties quoting the York-Antwerp rule providing that the cost of removing cargo, when necessary for common safety, should be admitted as general average.

* * *

Seek International Form To Cut Expense

A STANDARD marine insurance policy that would be satisfactory to all nationalities is finding favor among marine underwriters all over the globe. A movement in favor of the adoption of a standard contract has been simmering for a long time and at last seems to be making headway. The suggestion has been made that sometime soon a round table discussion be arranged for. Adoption of a uniform policy would reduce expenses, eliminate much misunderstanding and do away with a great deal of litigation, is the argument advanced by domestic marine men, who declare that they have already received the endorsement of Liverpool underwriters. The use of such a large number of different forms as is the present vogue is a source of continual criticism from shippers and other insureds and the simplification and standardization of the marine insurance policy would be a welcome change for those who must buy insurance in the different markets. The movement will no doubt receive fresh impetus when the various marine underwriting organizations start holding their regular meetings.

* * *

Insurance Chart Shows Ship Repair Costs

CHARTS, showing comparative ship repair costs in the New York district, have been prepared by the United States Salvage association, compiled through the joint efforts of W. C. Foley, chief surveyor of the United States Salvage association, and Frank Wright, of the Insurance Co. of North America. The chart shows that the average cost of repairs is influenced by three factors, namely, labor rates, steel prices and drydock charges. It shows costs over a period of nine years, and brings out the fact that at the present time, repair costs are 100 per cent more than before the war. The cost of labor is the chief contributing factor. The last two years show a downward tendency which can be readily contrasted with the upward line in 1917.

* * *

Merger Unites Two Insurance Firms

STOCKHOLDERS of the Washington Marine Insurance Co. and the United States Lloyds at a special meeting last month unanimously approved the plan providing for the merger of the two institutions. The approval of the New York state insurance department has already been received so that the consolidation is practically an accomplished fact. The dropping of the name of the Washington Marine is a blow to American marine insurance as that company, although relatively new, was looked upon as a pioneer company in the marine insurance field.

* * *

Adopt New Forms and Revised Rates

NEW forms of compensation cover for vessel risks and a revised schedule of rates for these classes became effective on Jan. 1. The new rates have been promulgated by the compensation inspection rating board and the New York state industrial commissioner and are adjusted to take care of the interpretation of the Knight act and the amendments to the federal judicial code. As a result of the New York law, employers who want to insure their obligations are forced to accept a compensation contract with compensation rates.

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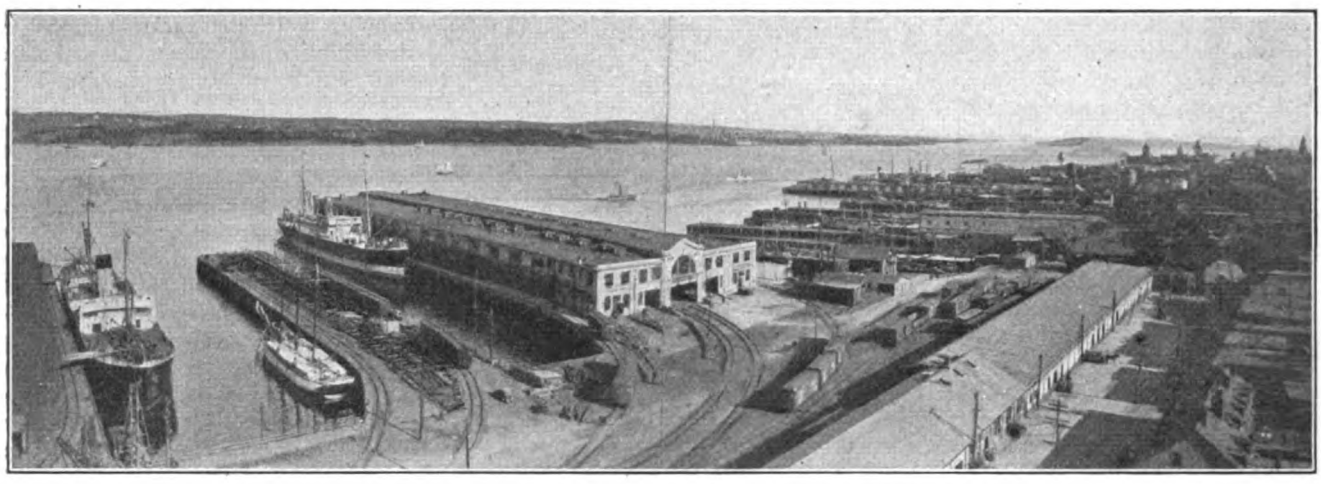
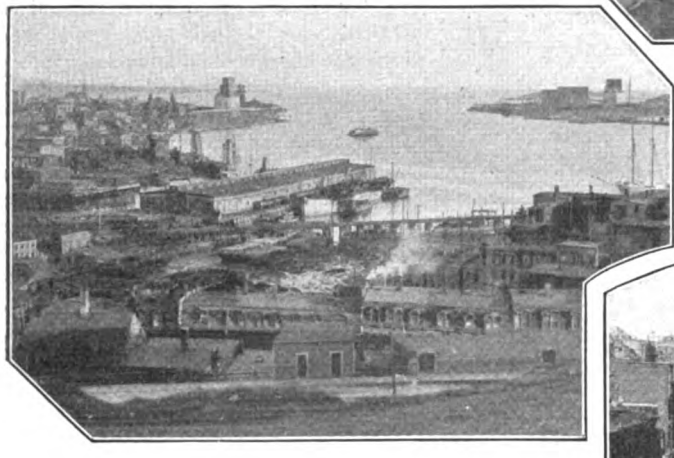
Photographs from Far and Near

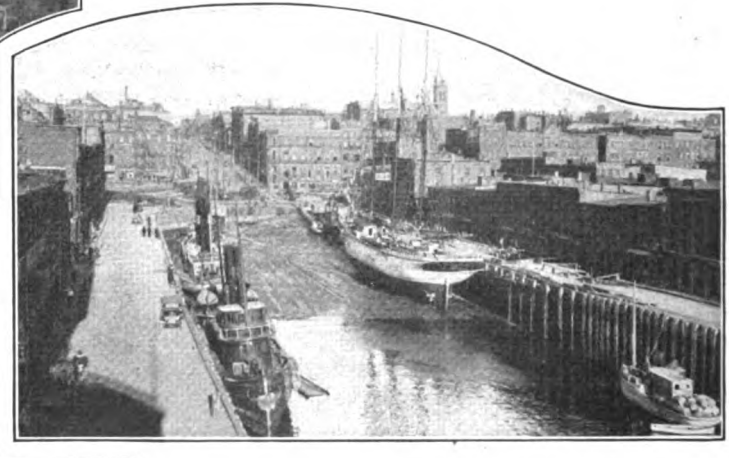


Great improvement is to be noted in Canadian port facilities, as trade with the United States and Europe has increased. Above is a striking panorama view of Halifax, showing the modern piers, warehouses and railroad terminals. In the center is the new steel and concrete pier. Halifax is growing rapidly as a maritime center

A closer view of Halifax, at the left, shows the steamers Rosalind and Silvia of the Red Cross line, unloading and taking on cargo. These steamers ply between New York, Halifax and Newfoundland. Export statistics show that Canada is buying American products in larger quantities



Halifax divides Canadian trade with St. John, when the St. Lawrence route to Quebec and Montreal is frozen during the winter. In the panorama view of St. John, at left, two large grain elevators are to be seen, overlooking each side of the harbor. Below is a natural drydock at St. John



At the left is a view of Quebec, showing the lower part of the city, and the view of the St. Lawrence from the heights residential district. Along the waterfront are the city's big warehouses, factories and grain elevators. More of the grain crop from the West flows through this port now than a few years ago

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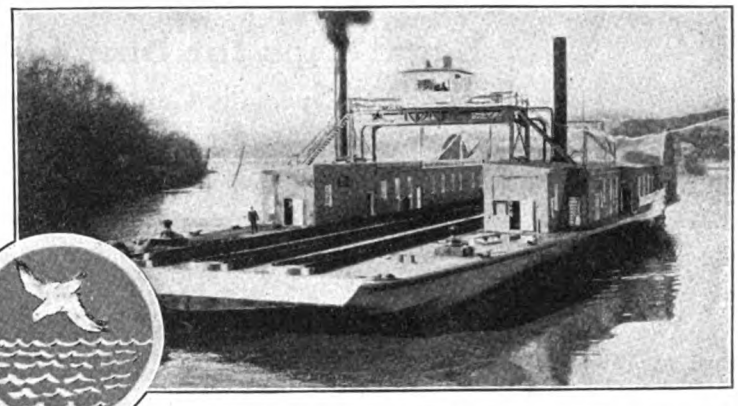
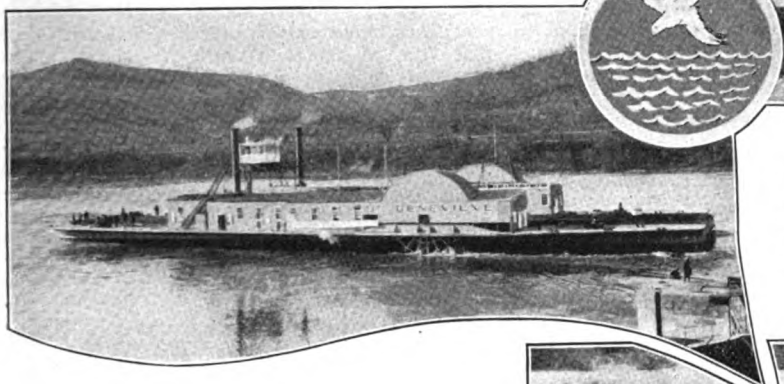
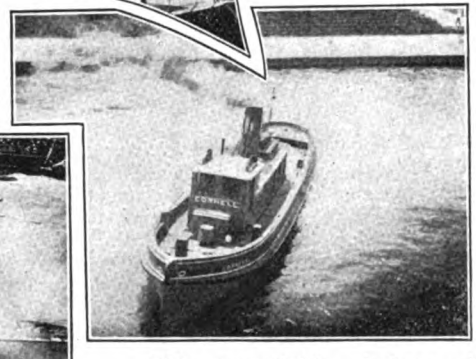
Latest Marine News in Pictures

The car ferry, Ste. Genevieve, built by the Charles Ward Engineering Works for the Missouri-Illinois railroad, for operation on the Mississippi, embodies some distinctive engineering features, made necessary by the character of the service. One of these is that the draft shall not exceed five feet, with full bunkers and a load of 10 cars of 82 tons each. The hull is sufficiently rigid to permit the carrying of a locomotive of 160 tons weight

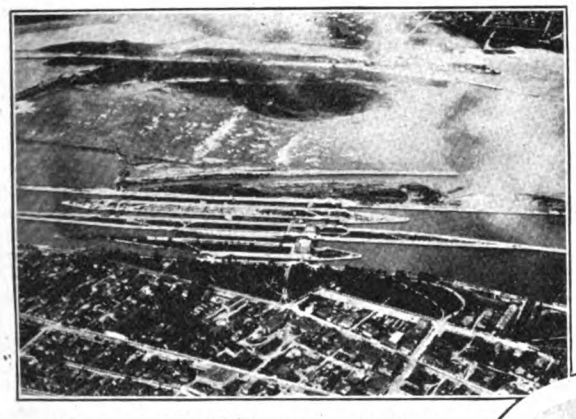




The ferry is of the single-deck side-wheel type, carrying three tracks. The length of the hull is 285 feet, depth 11 feet, molded beam 54 feet, and beam, over guards, 86 feet. The paddle wheels are 28 feet in diameter and 12 feet wide, and there are two rudders aft, operated by hand or steam



This is the tug Cornell which was lost, with her crew, in Lake Erie late in December. The tug was sold by the Great Lakes Towing Co., to Syracuse, N. Y., interests, and was enroute from Cleveland to Buffalo for delivery when she disappeared. Neither the wreck, nor the crew, save for one body, has been found



This remarkable airplane view of the world's heaviest traveled canal locks at Sault Ste. Marie, Mich., shows the channel of the canal, the layout of the locks, and, in the background, the rapids which make the canal necessary

Unusual difficulties were overcome by the bureau of lighthouses in erecting a light on Sail rock in the Virgin passage, West Indies, between Culebra and St. Thomas islands. The sides of the rock rise precipitously, and the feat was accomplished with great danger

To obtain information on the migration of salmon, 4000 sockeyes were tagged recently at points in the Shumagin islands, near the tip of the Alaska peninsula, and in Bering sea, near Port Moller. Aluminum tags were attached to the tails. Twenty-five cents is paid for the return of each tag.

Along the Copper river in Alaska, where salmon abound, the natives have rigged up a rude sort of fishing wheel where fish are caught and hauled in by hand

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Late Decisions in Maritime Law

Legal Tips for Ship Owners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

IT APPEARED in the case of Peters v. Rohrman, 272 *Federal Reporter* 338, that the master of a certain vessel had control of the management and navigation of the ship, and that he employed the officers and crew, made all her charters, determined the voyages which she would make, collected the earnings of the vessel, both freight and demurrage, and in the distribution of those earnings he first took the gross earnings, and from them deducted what is known as the port charges, pilotage, towage, custom fees, and all expenses incidental to getting the vessel in and out of port, and after making these deductions he divided the remainder into two parts, one of which he took, and from this part paid the wages, provisions and expenses of obtaining the crew, while from the other part, or one-half of the remainder, he deducted the cost of repairs and renewals, and divided what was left thereof among the other owners *pro rata*. The other owners did nothing at any time with respect to the making of charters. They were not consulted about them, and knew nothing regarding them at the time they were being made. Neither did they exercise any authority at any time with respect to the possession, manning, or navigation of the vessel. Apparently all they did was to receive their portion of the profits as sent to them by the captain. The court held that a master operating a vessel on shares is not *ipso facto* an owner *pro hac vice*, but an express agreement must be shown, or circumstances from which such agreement can be inferred, by which the possession and control of the vessel was surrendered to the master. It was then decided that the master in this case was the owner *pro hac vice*, and that the part owners were not liable for breach of a charter made by him.

* * *

Section 757 of Chapter, 410 of the laws of 1882, the New York City Consolidation act, providing that steamers shall not be propelled in the East river below Corlears Hook at a greater rate of speed than 8 miles an hour, means over the ground and includes the tide. A steamship which undertook to pass another going in the same direction while rounding Corlears Hook, was declared in the case of PLYMOUTH, 271 *Federal Reporter* 461, to be in fault for violating such statute, for attempting to pass the vessel ahead without getting the assent of the other vessel, as required by inland regulations, rule 8, and for crowding the overtaken vessel too close to the shore, so as to compel her to reverse, as a result of which she collided with a tug following her. The overtaken vessel, on the other hand, was at fault for not sooner reversing when she saw that the other steamship was intending to pass without getting her assent, and knew that the traffic ahead made such an attempt dangerous.

* * *

An admiralty court has no jurisdiction over a contract to procure permanent storage for all or a part of a cargo after it has been unloaded, it was held in Gowanus Storage Co., Inc., v. United States Shipping Board Emergency Fleet Corp., 271 *Federal Reporter* 528. Where a contract is, in part, not within the jurisdiction of an admiralty court, there can be no action in admiralty for a breach, if the part referred to is not separable.

* * *

Where a time charter party requires the owner to maintain a vessel in a thoroughly efficient state in hull and machinery for and during the service, but does not define the time within which the owner must so restore the vessel, all the owner is required to do, according to th decision in the case of BJORNEFJORD, 271 *Federal Reporter* 682, is to exercise reasonable and ordinary care to restore the vessel to a thoroughly efficient state for her service, and where the owner employed an experienced, reputable, and fully equipped ship repair concern to make the repairs, he is not liable for an additional delay due to the negligence of such concern.

* * *

"A state can not by law create liens against foreign vessels."—BOSTON, 271 *Federal Reporter* 688.

* * *

Act of congress of March 3, 1899, c. 425, sec. 15, providing that it shall not be lawful to tie up or anchor vessels or other craft in navigable channels in such a manner as to prevent or obstruct the passage of other vessels or craft, imposes an affirmative and positive duty upon vessels coming to anchor in navigable channels to see that they do not under any circumstances, accidents excepted, prevent or obstruct the passage of other vessels; not that they shall not anchor at all in such a channel, it was decided in the case of SOSUA, 271 *Federal Reporter* 772, but that when they anchor therein, they shall so anchor and in such method, as not to close the channel or unduly or unreasonably prevent or obstruct, the passage of other vessels. When a vessel intends, not only to stop in a channel in which she is moving, but to anchor and to swing around so that her length obstructs the channel, she is bound to give notice of her movement or intention, or warn others not to approach until she has completed her unusual maneuver.

* * *

If a claimant for necessaries knows that a vessel is under charter, he can by the exercise of reasonable diligence ascertain the terms of the charter party, and if a party, not the owner, attempts to obtain necessaries, reasonable diligence would require the furnisher to inquire of the one ordering concerning his relations to the owner of the vessel.—HURON, 271 *Federal Reporter* 781.

* * *

"The fact that a boat passed official and other inspections is not conclusive of the fact of seaworthiness."—VIKING, 271 *Federal Reporter* 801.

* * *

"It is elementary," declared the court in the case of McWilliams Bros., Inc., v. director general of railroads, 271 *Federal Reporter* 931, "that in every contract of towage it is impliedly agreed that the tug will use proper skill and diligence, and that she will not unnecessarily by negligence or mismanagement imperil her tow. The highest degree of skill is not required, for she is not a common carrier; neither is she an insurer. She is merely a bailee for hire. As such she is simply bound to exercise reasonable skill, care, and diligence. * * * From what has been said we must be understood as meaning that the degree of skill, care, and diligence for which the tug is liable is dependent upon the peculiar circumstances of each particular case and of the special hazards of the waters traversed. * * * The master of the tug is bound to know the channel and its usual currents, and dangers which are known generally to men experienced in its navigation. * * * And he must exercise that degree of care, caution, and maritime skill which prudent navigators usually employ in similar services. In all such cases the burden rests upon the libelant to prove affirmatively that the tug is in fault."

* * *

A tugboat which, when maneuvering in broad daylight to enter a crowded slip with a tow alongside, under the influence of an ebb tide, sagged against a vessel lying at the end of the pier with her bow over the line of the ship, was not liable for the injury caused to such vessel, unless she was carelessly or recklessly navigated.—HENRY LEE, 271 *Federal Reporter* 41.

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Editorial

Merchant Ships and the Navy

AN ADEQUATE navy has been the fixed policy of the United States in recent years. Politics have not entered into this question as both of the great political parties have had their share in upbuilding the navy. Over a year ago, by agreement with the other great naval powers, certain ships were scrapped, the building of proposed new ships was abandoned and the navy limited in size so that it would equal that of Great Britain. No treaty or agreement between nations, in all history, has received such unanimous approval. How would the people of the United States receive the news that a treaty had been agreed upon in which their navy alone was to be reduced and limited while all other nations were to keep their fleets intact and to add to them as they saw fit? Only one guess is necessary, the people of the United States would feel that they had been betrayed. But if by laxity and national inertia the American navy falls below the fair equality agreed on at the conference on disarmament the result in effect is the same.

In maintaining this equality, no factor is of more importance than an efficient, well rounded and adequate merchant marine. At a recent address in the Union League club, New York, Admiral W. S. Sims, retired, made this significant statement, "If our fleet were equal in all other respects to the British fleet, it would be inferior because of the size of the British merchant marine and of the fact that she has fast transport ships, in which our merchant marine is deficient. It is impossible for a fleet to move without a merchant marine. It can go only so far as its supplies will take it and then come back."

Truth and logic should prevail in reaching decisions on national policy. That the need of a merchant marine in making the fleet effective, is true can not be denied. It is not logical to build and maintain a powerful navy and to relegate the fate of the merchant marine to chance.

Great Lakes Shipping in 1922

BUSINESS revivals in a few favored industries came with startling rapidity during 1922, with the automobile trade occupying the position of greatest prominence. Shipping on the Great Lakes closed in December a season equally marked by a complete lack of demand at the opening and a mounting flood of orders toward the close.

A year ago, prospects for the 1922 season with the iron and steel industry stagnant, were discouraging. Each month of the season brought on an expanded demand. But offsetting factors prevented the season from being satisfactory and profitable. The coal strike was a sharp blow, shutting back tonnage at a time when the vessels could have handled upbound cargoes to advantage. The iron ore demand was consistently heavier all season than had been predicted. In the late fall, the grain movement promised profitable cargoes but inability of the railroads to keep the unloading elevators free caused long delays to the boats. Early December storms stopped the plans for hauling late cargoes at advanced rates. The season excelled its first forecasts but fell short of its later promises.

Study Rules To Win Savings

WHEN the United States completed the canal through the isthmus of Panama, many Americans were of the opinion that it would be no more than just and fair to allow American ships to go through toll free, or at least on a more favorable basis than the ships of foreign nations. These dreams of benefits to the American merchant marine were rudely shattered, when England pointed to the terms in the Hay-Pauncefote treaty, that all the nations of the world were to use the canal on a basis of perfect equality. It is not the intention here to raise again the issue of the right of the United States to remit tolls for American ships. But a general impression of American ships in Panama trade being at a real disadvantage is worth correcting.

The repetition from mouth to mouth and from publication to publication of generalities, without investigation or analysis, has made some American shipping men feel convinced that they are at a disadvantage in the use of the Panama canal and that ships of other nations in some way not clearly defined, pay considerably less in tolls. An investigation of the subject, given in these pages last month demonstrates there is at least no discrimination against American ships, as the standard for levying tolls is uniform, all ships being governed by the Panama canal rules and the Unites States national rules for measurement of tonnage. Carelessness in complying with the requirements of American laws, has often, however, increased the tonnage figures of American ships and *made it seem* as though they were discriminated against. This is typical of the haphazard manner in which a part of the American merchant marine is operated.

American steamship operators should certainly familiarize themselves thoroughly with all factors that have a direct bearing on disbursements. It is self-evident that economical operation is the most vital factor in the success of any merchant marine. Particularly is this true for American ships, as this country has its own products to move and can readily enough get the business provided rates and service compare favorably. Before competitive success will go to American ships, their operators will need to become thoroughly versed in many conditions and customs, which in a thousand ways indirectly as well as directly affect disbursements.

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World's Motorships Gain 37 Per Cent in Year

The following table shows the number and tonnage of motorships of 2000 gross tons and over under various flags for the past two years:

Countries	1921 Number	1921 Gross tons	1922 Number	1922 Gross tons
United Kingdom	34	217,104	52	335,766
Denmark	21	121,580	22	129,507
Sweden	20	91,681	27	123,753
Norway	21	85,032	27	120,442
United States	28	86,457	30	101,672
Italy	6	26,449	7	36,476
Other	15	63,467	21	98,325
Total	145	691,770	186	945,941

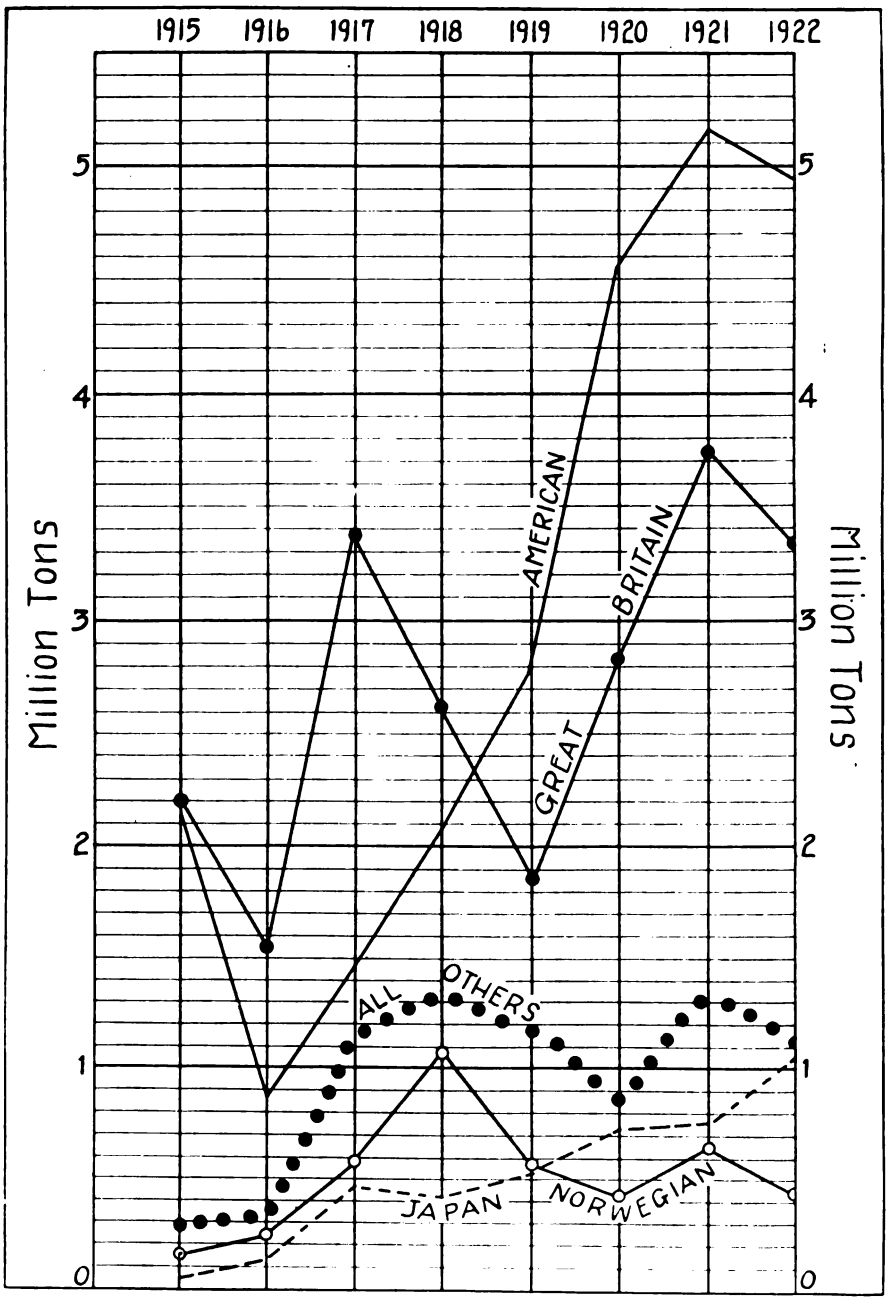
Last year set a new record for Hongkong shipping. The total shipping entering and clearing was 672,681 vessels of 43,420,970 tons. Ships in foreign trade also put up a new high mark with entrances and clearances of 52,223 vessels of 27,852,616 tons.

Plan Bank to Help Foreign Trade

Of especial interest to shipping men is the recent incorporation of the Maritime Trust Co., New York. The organizers are planning to operate the new bank on such lines as to make it the natural home of foreign trade, by bringing into the bank men of business who know the needs of commerce. Shipping, export, coal, oil and manufacturing interests which have contact with foreign trade, will be invited to become stockholders in the new institution. No special group of capitalists will have control. The location will be in down town New York. Some of the leading men of the steamship, marine insurance, shipbuilding and oil businesses are among the incorporators.

River shipments of steel on a large scale are growing. Recently the Carnegie Steel Co. sent 8500 tons of pipe, structural shapes, and bars valued at $350,000 loaded in ten barges from Pittsburgh down the Ohio and Mississippi rivers for delivery at Evansville, St. Louis and New Orleans. The trip was expected to take about 20 days.

American Ships Hold Lead in Trade Through Panama Canal



HOW LEADING MARITIME NATIONS HAVE DIVIDED PANAMA CANAL TRAFFIC

IN THE eight years that the Panama canal has been open, the United States and Great Britain have divided the leadership equally. From 1915 through 1918 more cargo was carried through the canal in British vessels with American ships handling the second largest amount. In the last four years, American ships have carried more cargo each year with British vessels second.

The accompanying chart shows the complete cargo carrying records of American, British, Norwegian and Japanese vessels separately since the canal opened as well as the comparative line for ships of all other nations. In total tons of cargo carried since the canal opened the different countries rank as follows: United States, 24,030,333; British, 21,555,924; Norwegian, 4,112,451; Japanese, 4,047,034; Danish 1,836,831; Dutch, 1,390,427; French, 901,675; Chilean, 816,154; Swedish, 815,691; Peruvian, 783,999; Spanish, 384,861; Italian, 168,330. In the past eight years, ships of all other flags have only carried a total of 504,696 tons. Of the grand total of 61,348,406 tons, American ships have carried 39 per cent and British ships 35 per cent.

In the last fiscal year, 2736 vessels transited the canal of which 1095 or 2 out of 5 were American. The United States vessels furnished 43½ per cent of the total tonnage and carried approximately 45 per cent of all the cargo transported through the canal last year.

British vessels ran second, numbering 935 or approximately 1 out of 3. They furnished about one-third of all the tonnage and carried approximately 30 per cent of the total cargo. Japanese vessels were third with 189, comprising 8 per cent of the tonnage and handling 10 per cent of the cargo, a big increase over the preceding year. Norwegian vessels were fourth, comprising 3.3 per cent of the total.

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Standardization in Shipbuilding

Study of Progress Already Made, Difficulties To Be Surmounted and Advantages Which Will Result

BY E. H RIGG

DURING the last two decades there have been many converts to standardization; it has made stronger headway in fields other than shipbuilding, and there is almost no one today who will deny the value of the general principle. It is when you come to apply it to concrete cases that difficulties arise. Without standardization, shipbuilding, as we knew it during the war, would have been impossible; the question is, therefore, on the extent to which it shall be carried rather than on whether or not standardization shall be adopted.

Engineering standards have been a recognized necessity for many years, though it is only comparatively recently that they have reached their present status and extent in the engineering world.

We are partly taken care of in shipbuilding standardization by such bodies as the federal bureau of standards, the American bureau of shipping, the United States steamboat inspection service, the American Society for Testing Materials, the American Engineering Standards committee, also the treasury and navy departments. The navy department is mentioned here last merely because this paper mainly deals with merchant shipping. On navy work, navy standards are naturally paramount, and their influence also extends into merchant work in yards doing both kinds. Owing to the service conditions under which warships operate, these standards are generally more exacting than those governing merchantmen.

Much Already Done

Apart from the well known and long-established classification societies, there is a relatively new body of this nature that bears on our business to a considerable extent, namely, the British Engineering Standards association, whose work in standardizing specifications for structural materials, products and fittings entering into ship construction is decidedly more far reaching than anything we have; however, as noted above, we are by no means without similar bodies.

Standardization is a large subject. The deeper one gets into it the larger the possibilities, and, as would be expected, the more impressive the difficulties.

A paper on this subject read before the North East Coast Institution of Engineers and Shipbuilders by C. le Maistre, secretary of the British Engineering Standards association, in March of this year, is both interesting and informative. One among many interesting points brought out is to the effect that standardization has reduced steel costs of production by at least 5 shillings (nominally $1.25) per ton; such points effectually nailed down as proved will do more than many sermons to convert the skeptical. A study of this paper will well repay those interested and will also show the standing which standardization has already attained in shipbuilding abroad.

Standard Ships

An extremely interesting test of the value placed on standards is to ask one of our yards to build a vessel using Whitworth standard screw threads throughout. It looks fairly innocent at first, but wait till you begin writing to the makers of the auxiliary machinery, to say nothing of your own machine shop's feelings in the matter!

Taking standardized ships first, as distinguished from variegated ships built from standard parts: during the war we built many such standard ships; the Hog Island, Submarine Boat Corp. and Great Lakes numbers and types of standard cargo vessels stand out preeminently as the biggest efforts along those lines. There were also other standard cargo types, but these were built in fewer numbers. The vast numbers of submarine chasers are another instance, also the large number of destroyers built for the navy.

The cargo vessels above referred to were laid down to meet a war need, it is true, but they remain distinct from the strictly naval vessels. As one effective answer to the submarine campaign of the enemy, they, without doubt, fulfilled their object. The 7825-ton Hog Island boats are a more generally useful type than the Submarine Boat 5075-tonners or the Great Lakes 4200-ton steamers, useful as these smaller vessels are in such localities as the Baltic and on the short-run trades.

That we shall again witness such an effort is not probable; further, that this effort has helped to put a quietus on general cargo vessel construction for some time ahead is also to be admitted. As an example of standardized work which justified its conceivers, there is no doubt that it did more than make good; while there were differences in detail in these groups, such minor variations did not alter the status of the ships as standardized products. These detailed differences sometimes indicated progress, but were in many cases unjustifiable and extremely annoying to the builders; they serve to emphasize one of the main arguments against standardization, namely, that it prevents progress. Automobiles are standardized, but that does not prevent improvements being made in the 1922 over the 1921 model. In the same way, succeeding ships for a particular trade can and do embody improvements over the earlier ones.

The situation for standard ships would appear to be as follows: In emergency, when large numbers of ships are wanted in a hurry, by all means build to a standardized design. When all are building in one yard this holds absolutely; when building in several yards it holds in general, with the qualification that each yard should be allowed to adhere to its own general way of doing business and to work to the same general plans and specifications in its own way, with freedom as to details. This can be qualified to say that full consideration should be given to a yard having plans, etc., available for a vessel substantially equivalent to the proposed standard ship.

Machinery Should Be Similar

Main and auxiliary machinery should be common to all ships of the type and, therefore, interchangeable from ship to ship to a very large extent; this has helped deliveries frequently when a broken part in an earlier ship can be taken from a later vessel.

As a normal proposition, wholesale standardization of complete ships is not to be looked for. It cannot be denied, however, that there are so many tramps of certain deadweights as to very closely approximate standardization. The large class of 7000 to 8000 tonners is worth noting, even though we have variety in detail to suit different builders' and owners' ideas.

When repeat orders are given for a

Presented at the thirtieth general meeting of the Society of Naval Architects and Marine Engineers, New York, Nov. 8-9. The author is naval architect of the New York Shipbuilding Corp., Camden, N. J.

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vessel already built, the work is thus partly standardized. There are many instances of this on record; a type proves satisfactory in service and may be repeated at intervals in groups as many as 15 or 20 times, with only minor and detail changes. The work is thus spread over a period of years, so that the advantages due to repetition work in the shops do not enter into the consideration. The main advantage is in time, because the design, plans, material-orders and specifications are immediately available.

In Passenger Ships

Oil and cargo ships come in the repeat-order category rather than passenger ships. The shipping board 535-foot passenger ships were an example of a large number of ships laid down to the same original plans as troopships, but finished up in groups for several lines and services as passenger ships. The hulls were practically identical, but even here changes were made to get different oil-fuel capacities; the machinery was built in groups to spread the work to different boiler, turbine and gear plants, so there was only partial standardization in machinery. The passenger accommodations were most wide of "sameness." While it is misleading to say that no two ships were alike, it is fair to say that with sameness of outline plans we have very considerable differences in detailed arrangements and decorative schemes, so that these differences finally resulted in a fleet wherein there were greater or lesser differences in every ship. Arguing from this and from general experience, standardization of passenger ships may be dismissed from serious consideration, except in quite small groups. Shipbuilding, in the nature of things, does not lend itself to standardization as a whole, but to build large ships in groups of limited numbers, suitable to particular trades, is a practice as old and older than anyone living today.

There is a large field where more has been accomplished than meets the eye on first approaching the subject, namely, international agreements on such matters as rules for avoiding collisions; signal codes; tonnage laws; lifeboats, and subdivision of passenger ships. Working agreements between classification societies in different countries tend toward broad gage standardization. Standard loadline regulations are well on the way to international scope. Agreement to recognize each other's inspection certificates covering passenger and crew accommodations between countries having substantially the same regulations is another step toward the common goal.

The tendency toward international codes covering the fundamentals of shipping both as to building and to operating is right and proper, particularly when it is remembered that the high seas are world wide and provide highways common to all nations. The sea does not ask if a ship be American or French, but treats them all alike; hence the growing volume of international standardization of fundamentals is to be welcomed and helped as a means of getting along better with international intercourse and trade.

Turning to the standardization of parts entering into ship construction, we find much to study. We also find great progress to record. We even find some progress toward international standardization, though this phase of the problem has naturally not progressed nearly as far as international covenants covering broad principles.

Consider the steel of which ships are nowadays constructed. Wood, iron and concrete need not be considered here, because merchant shipping today is, to all practical intents and purposes, universally constructed of steel.

International specifications for ship steel have not yet arrived in spite of efforts which were under way when the war broke; the difficulties are great, and they begin in the mines where different ores have different characteristics and properties. A universal specification is difficult to draw that would avoid undue favor to some mills as compared with others. American, British and German steels have their own characteristics, but given a willingness to co-operate, it should not be impracticable to draw specifications broad enough to cover a merchantable article satisfactory for use the world over. One great question is: Can genuine willingness to agree, if possible, be obtained? Without at least that as a basis, it is no use trying for international steel standards.

Progress in Structurals

During the war, considerable progress was made toward international standard rolled sections, such as angles, channels and bulbs; this as between America and Britain. Here we have two standards, structural shapes and ship shapes, these ship shapes being identical with the British except in minor points; there they have one set of standards for bridges, buildings and ships. There is considerable opinion in favor of a single standard here. The manufacturers fear scrapping of equipment before it is worn out; the answer is that properly regulated standardization is not an over-night affair and will involve no scrapping of good equipment. France has been on a metric basis of measurement almost as long as the memory of man runneth, but I am told that even yet in the remote rural districts the old nonmetric units are largely used in local trading.

The inch, pound and metric units involve us in trouble when considering international standards. The obvious way to get around it is by printing two columns parallel to each other; customers in metric countries can use the one in which they can think best. The metric system, or lack of it, is no bar to international standards, though it is an admitted difficulty.

Since the war, progress toward international rolled steel standards is to be noted on the part of Australia, Belgium and France, as well as between ourselves and Britain. Plain angles present few difficulties; the channels, bulbs and I-sections are the crux of the matter. Standardization of what we may term secondary ship materials such as brass, bronze, iron and wood is also to be kept in mind.

Sincerity Is Important

Again a real question is: How willing are the different parties to go at the matter and find a solution that will give the best sections designable and commercially manufacturable at this date? Without this willingness, we are merely beating the air.

The war has done at least one good thing: it has taught us that undertakings before considered impossible can be put through provided the will to accomplish is there; that men and women of many races can forget petty differences and work together for a common goal. Whether broad gage sentiments similar to those inspired by the stress of war can also be invoked for peace time objects is at least open to debate, especially in the present condition of world affairs.

Again, do the foreign trade elements of each nation want uniformity in these matters, or do they want the tower of Babel?

The transition stage would have its troubles; the present state has its disadvantages. The same solution for steel specifications, both as to composition and dimensions, as has already been applied to such matters as tonnage, safety regulations, etc., would appear to the writer as the proper one, namely, broad-gage standardization on an international basis with equitable leeway to each nation as far as individual peculiarities are concerned, such as extend from mine to finished product.

In developing new countries, is it an advantage or a disadvantage to have similar structures and equipment built to varying specifications, and to whom do the advantages and disadvantages accrue respectively?

It is to be noted that the department of commerce, under Mr. Hoover's leadership, is endeavoring to eliminate

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waste and reduce costs and so to extend the benefits resulting from simplified practices in industry. The machinery that it is proposed to set up will be representative of all interests concerned and will have safeguards to prevent rejection of newer and better ideas as they come along.

Mr. Hoover uses the word "simplification," which is not the same as "standardization," though in many respects the two will be hard to separate. It is well to bear in mind the differences between the two words; their meanings and applications will converge and diverge as we study our subject in all its ramifications.

The procedure suggested by Mr. Hoover is very much that of the American Society for Testing Materials, where producers and consumers sit down together and agree to agree or disagree on standard specifications for the major materials and their subdivisions.

A study of Mr. leMaistre's paper referred to above will throw an interesting light on what is being done along the lines of standardization and simplification in British shipbuilding and other of her big manufacturing industries.

A study of the pocket books issued by the different steel manufacturers will impress one with the vast number of special shapes to which steel is rolled; that a gradual reduction in number of special shapes would benefit everyone concerned will hardly be disputed. As existing commercial equipment wears out this becomes at least possible.

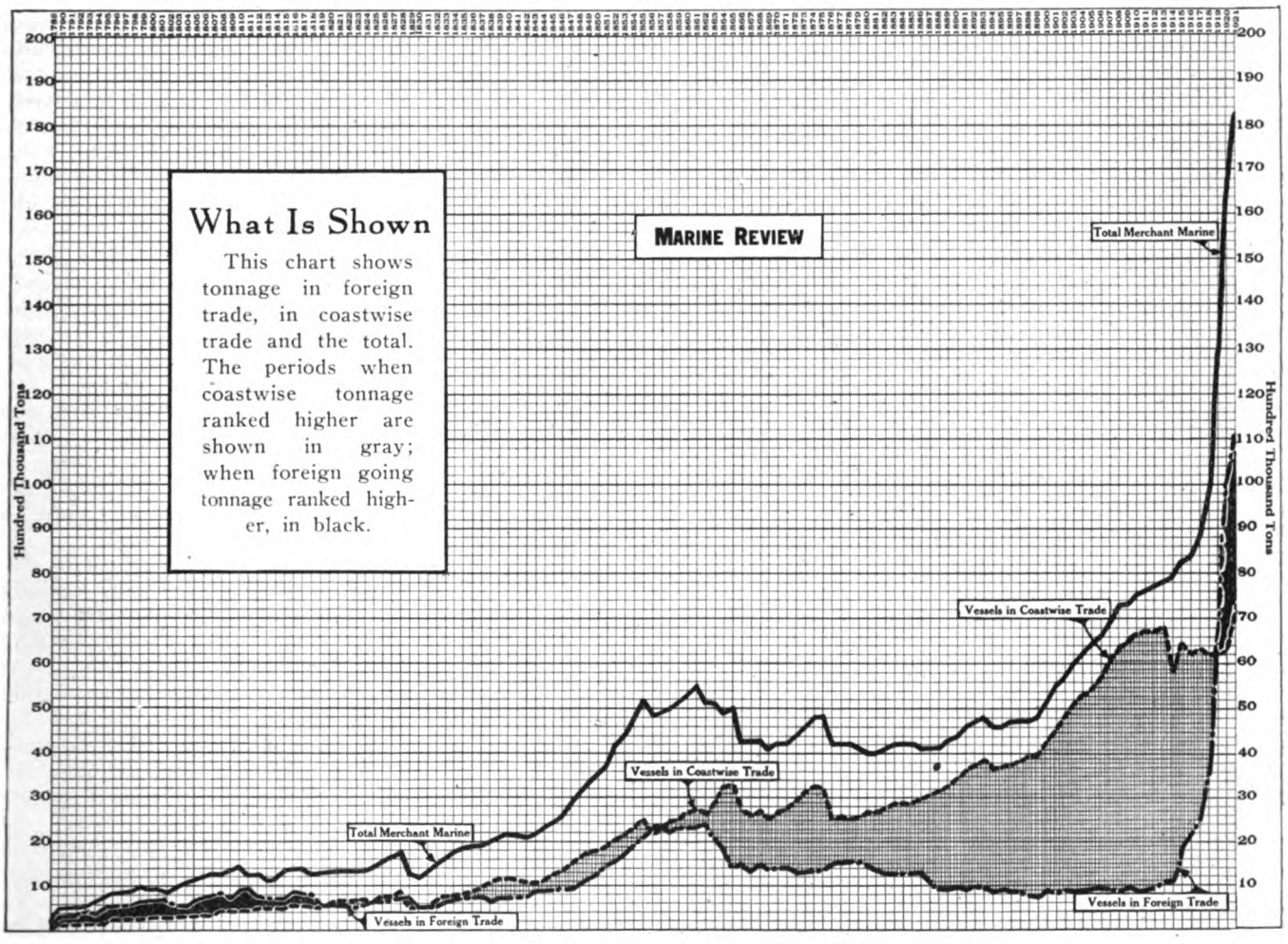
Regarding standardized methods of production, shipyards are organizations subdivided into many departments or trades. They are not unaware of what is going on in the general industrial world in the way of advanced methods. There are at least two good reasons why the practices of factories, pure and simple, cannot be fully applied; one is the diversity of product as between ship and ship, and the other is diversity of parts entering into any one ship.

What all efficient yards are doing, particularly since the present depression set in, is to so organize their methods as to adopt for each shop the best that can be worked in. We all have certain routine ways of doing things. In a poor plant the routine runs the plant for a certain or uncertain season; in a good plant the routine is modified and improved conservatively and constantly in such a way as to cut down work, save time and labor, eliminate duplication, and also secure harmony and effective intermeshing of departments.

Too much departmentalization will kill any shipyard. You all know the small minded departmentalist who cares not what happens to the department on each side of him, just so long as his particular department makes a good showing.

Modern established yards have their own standard ways of handling work; from design to delivery, standard forms and methods are used. These should only be changed conservatively, and after management is sure that they have all the cards on the table; a change made to suit one noisy departmentalist will almost surely bring trouble and can very easily change a profit into a loss on the completed ship. We also have standard specifications. For yards handling more or less one line of work, this is undoubtedly correct; for yards with a diversified product it is still

Complete Record in Graphic Form of American Shipping in the Past Century


What Is Shown
This chart shows tonnage in foreign trade, in coastwise trade and the total. The periods when coastwise tonnage ranked higher are shown in gray; when foreign going tonnage ranked higher, in black.
MARINE REVIEW
Hundred Thousand Tons
Total Merchant Marine
Vessels in Coastwise Trade
Vessels in Coastwise Trade
Total Merchant Marine
Vessels in Foreign Trade
Vessels in Foreign Trade

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correct, but cannot be made to work without greater labor in adjustment to particular cases. These specifications should follow in arrangement the yard charge and plan numbering system, so that an index is unnecessary to one familiar with the system, thus saving more time for more people than will be realized. The index should be there for convenience of owners and others not acquainted with the system.

It seems hardly necessary to say that all forms and drawings should be uniform, also all calculations, material-orders and correspondence methods. The responsibilities and limitations of each department should be clearly defined and no point left in the air to fall hapless between two or more parties.

Standard Details and Fittings

We now come to standard details. Each established yard now has its own standards and each owner has his own particular requirements. Each yard wants to use its own standards, which works for a cheaper ship.

The British have decided that there is no good reason why a lot of fittings and equipment cannot be nationally standardized and, having decided so, they are doing it. There is a host of fittings that lend themselves to this treatment, such as manholes, airports, doors, davits, boats, bitts, cleats, chocks, sanitary fittings, winches, windlasses, anchors, chains, steering gears, etc., down to minor fittings such as cups and saucers. Provided the standards are of a good quality and agreed upon by the jointly interested parties why not eliminate as much special work as we can? This British experiment is well worth noting as we press on our way to the building of ships economically.

With standardized fittings it is easy to see both time and money saved; stocks can be kept fuller without fear of loss.

With reference to machinery, we have just arrived at standard specifications for moderate-powered, reciprocating-engined, Scotch-boilered cargo boats. We arrived there, however, in the midst of the modern upheaval in methods of propulsion; the claims of diesel drives, diesel-electric drives; electric, hydraulic or mechanical reduction-gear drives, direct-turbine drives, watertube boilers versus cylindrical, also last, but scarcely least, the war.

The standard specifications here referred to are those prepared in Britain with a view to harmonizing classification and governmental requirements for main engines and boilers and giving to builders one set of rules and specifications to work out. What success has attended their practical working is not known to the writer.

The reconciliation of classification and governmental requirements where these overlap is something which will save time and money; the application of two or three formulas to figure out the same dimension involves duplication of effort and, consequently, waste.

Motors for ship propulsion are a modern development. We already find elaborate standardization here for several reasons; with uniform power per cylinder, engines of four, six or eight cylinders are built. Oil engines are complex affairs at the best; the more parts to a given design the lower the already high cost per unit of power can be kept. Further, their manufacture commenced at a period when the benefits of standardization were already realized.

Electricity plays an increasingly important part in the auxiliary installations aboard ships. This industry is already highly standardized. The requirements of land and sea services should be brought as nearly to a common basis as is practicable.

The importance of quick turn around in ports needs no emphasis before this body. The advantage of standardization in giving owners and repair plants a reasonably generous stock of spares to draw from is obvious. With greater standardization in building, especially in machinery we automatically get advantages in the matter of prompt availability of parts for repairs and renewals, the economy of which speaks for itself. The more general the standards, the fewer and less expensive the spare parts each individual ship will need on board. Certain parts liable to be needed at sea will always have to be carried, but stocks at terminals can be kept lower without danger of delay to the ship.

Uniform Requirements

Standardization is a natural and inevitable corollary of modern industrialism; mechanisms are both more elaborate and more generally used than formerly. A plant in Chicago manufacturing and selling any one or more of many well known modern mechanisms must consider the ability of its distant customer to keep the machine in condition. What ultimate good is a typewriter, for example, which the owner cannot keep in repair; the "throw it away and buy a new one" answer is that of the reckless cub salesman, except after the machine is worn out or genuinely obsolete. The only proper answer is standardization of machine and of such spares as are most liable to be needed, backed up by the most efficient distributing agencies available.

The codification of governmental requirements for merchant vessels under one set of regulations should be aimed at; at present these are scattered and come under different departments for enforcement.

The reconciliation of the requirements of two or more bodies with concurrent jurisdiction is very important. The most outstanding case is perhaps that of boilers, the United States steamboat inspection service and the classification societies, each having its own formulas. The success which has attended the adoption of the A. S. M. E. boiler code for land works needs no emphasis.

That the practical benefits of uniform requirements on an international basis are not lost to sight is evidenced by the recent reports of the committees appointed by the International Shipping conference last November. These reports mark a step toward agreement on four important questions connected with shipbuilding, namely, life-saving appliances, wireless telegraphy, loadline and passenger ship subdivision. The absence of United States representatives on these committees is to be noted, the writer feels, with regret.

Summary

Uniform standards of strength for ocean going vessels may well be considered; the proposed international loadline regulations give us a basis. The various classification societies each have their own; in practice they are fairly close to uniformity. The extent to which their rules could with advantage be standardized might well form a subject for future discussion.

History has shown conclusively that standardization has already greatly benefited mankind; imagine the chaos if each mechanic cut screw threads to suit his own ideas, as was done in the early days. The whole point is that of arriving at well balanced decisions on how far to go. Excessive standardization makes for lack of progress, while too little tends to restrict production. The right amount means the maximum of comfort and pleasure in life for the minimum cost, the greatest good for the greatest number.

The same general principles can be applied to shipbuilding, particularly in countries where the volume of business is so proportioned to the number of plants that each can specialize along certain definite lines. There are different designs of cars, sewing machines and typewriters, each made by the same plant but for different purposes, so that even where standardization is most developed we do not find absolute uniformity.

Descriptive information covering the port of Norfolk, Va., is given in a folder recently published in Spanish and Portuguese. The latest edition was prepared especially for the world exposition at Rio de Janeiro.

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Equipment Used Afloat, Ashore

Boiler Room Labor Saving Tools—Weld Cast Steel Stern Frame—Lifeboat Releasing Gear—Motor Driven Chain Hoist —Multistage Centrifugal Pump of New Design

TWO broad factors enter into the safety and length of life of marine boilers. In boilers, the utmost care should certainly be taken to secure proper design, correct capacity, and steaming efficiency. After this of equal if not greater importance is the quality of materials and workmanship. The best materials and workmanship, though sometimes increasing initial cost will pay well in the long run. Owing to the severe conditions of service, a marine boiler cannot be built carelessly with any expectation of satisfactory operation, and there is no such thing as "good enough" in this particular product. Anything less than the best will be a source of endless trouble and expense.

Starting out with a really good boiler, entirely suitable for the service contemplated, the other important factor is proper operation and care. Practical considerations seriously affect ideal conditions in operation. All possible precautions, however, should be taken to insure water of such properties that corrosion and scale are eliminated or at least reduced to an absolute minimum. It is, of course, fundamental that a correct steaming level be maintained, that the boiler is not forced and that steam is not raised too quickly. Regular inspection and cleaning of the boiler is absolutely essential for proper care.

In a water tube boiler for thorough inspection, cleaning and the renewal of tubes, it is necessary to remove the header caps. These caps may be circular, square, elliptical or oval in shape. These header caps are fitted with gaskets between the cap and a seat on the inside of the header, the pressure of the steam tending to hold the cap to its seat. The oval shape permits the removal of the cap in a minimum of time. In the removal of the cap, some difficulty is usually experienced in obtaining a perfectly clean surface both on the cap and on the inside of the header forming the seat. In good operating practice, graphite is thoroughly applied to the face of the gasket and when this is carefully done the old gasket comes off with the cap. Scale incrustations due to seepage under the gasket and particles of gasket fiber still adhere to the seat and must be removed and the surface made bright and clean before refitting the header cap with a fresh gasket.

To clean the header seats by using a shaped scraper and feeling the surface by hand is a long and tedious process and does not insure perfect results and consequently there is danger of leaky joints. For speeding up this work and to accomplish it with a uniform thoroughness, a mechanical hand hole scraper, shown in the accompanying illustration, Fig. 2, somewhat resembling a valve reseating tool, has been developed. It is claimed that this tool will eliminate leaky joints and save boiler time and costs in doing the work. The tool is set with a yoke resting against the outside of the header, with a bar and handle operating a holder with bitts or scrapers held in place against the seat inside the header by the tension of a spring. A somewhat different tool holder is used for the oval holes.

Rather more difficult and complicated though of equal importance, is the cleaning of the boiler caps. In this case machines of somewhat different designs have been developed to meet the requirements of the various different shaped heads. The accompanying illustration, Fig. 1, shows the machine for cleaning the oval shaped cap.

To clean the header cap seat, the cap is placed in the recessed holder and clamped in position by the tail stock plunger. The cap held securely in place is rotated and the required tool in the turreted tool holder is brought into contact with the seat and held there by spring tension in both the plane of the seat and axially. It is possible

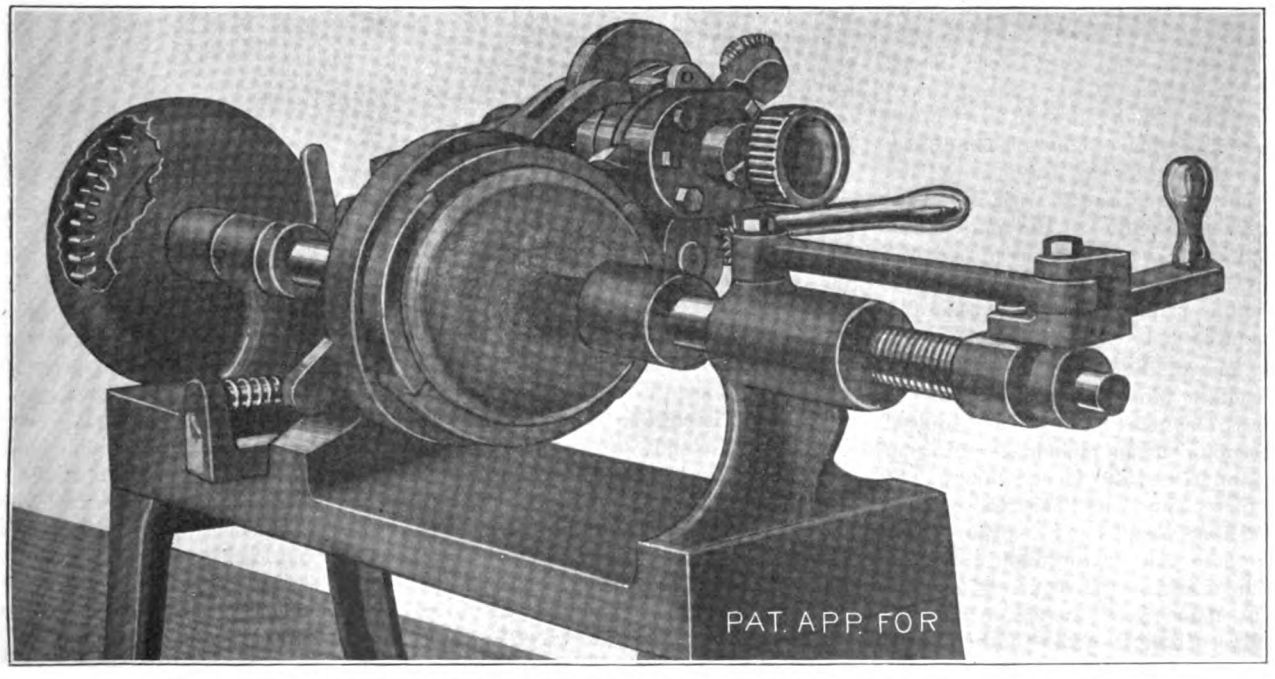

FIG. 1—MACHINE FOR CLEANING OVAL OR ELLIPTICAL HAND HOLE CAPS OR PLATES

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FIG. 2—MACHINE FOR RAPID SCRAPING OF WATERTUBE BOILER HAND HOLE SEATS

to withdraw the tool holder when the cap is to be inserted or removed. Tools of different design are provided to meet the requirements of different types of gaskets used.

First the gasket is removed by a scalping or stripping tool or a flat cutting tool. The remaining fibers, scale incrustation or other foreign matter are removed by a stiff wire brush of special design. This machine may be operated either by hand or power. A ¼-horsepower motor with 250 revolutions per minute at the pulley will give all the required power, and the cap is revolved usually at about 50 revolutions per minute. The motor can be connected to any lighting circuit.

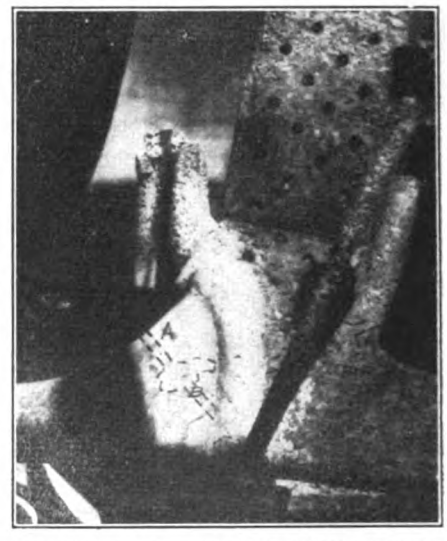
Any one of the tools can be brought into contact while the cap is revolving, and it is claimed that the time required for cleaning a cap including setting in place and removing, is one minute. It is further claimed that whereas 6 to 12 caps can be cleaned per hour by hand, 60 or more can be thoroughly cleaned by this machine per hour. More important than speed in the mechanical cleaning of these seats both in the header and the caps is the claim made that perfect joints can be obtained. The above described mechanical hand hole scraper and machine for cleaning header caps are being manufactured by the Paragon Power Specialties Co., Hartford, Conn., for the Roto Co., 50 Church street, New York. Tools of the above nature are important accessories for any power plant where water tube boilers are used and will materially aid in their care and upkeep, and also materially lighten the tediousness and labor of doing the same work by hand.

Weld Porous Cast Steel Stern Frame

Successful welding of a cracked cast steel stern frame of a ship is a matter of some interest to shipowners. Some time ago, a casting of the proportions required for a stern frame, would not have been considered. Owing, however, to the great difference in first cost between the old fashioned forged stern frame and a steel casting, many ships built within the last seven years or so have had cast stern frames. The early results were not uniformly satisfactory. In one instance alone, of three sister ships built in 1917 and 1918, two at least cracked their cast steel stern frames. The seriousness of such a failure can be appreciated, if to make repairs the stern frame had to be removed and a new one supplied and fitted. The art of welding fortunately has advanced rapidly and the classification societies, American Bureau and Lloyd's, will accept as a complete repair the proper welding of even such an important member as a stern frame.

A particularly interesting welding job of a cast steel stern frame where internal cavities or blowholes in the casting were encountered was recently successfully accomplished by the Metal & Thermit Corp., 120 Broadway, New York. When the steamship CANOGA drydocked at the Newport News Shipbuilding & Drydock Co., plant for repairs to her stern frame, internal cavities were discovered in the casting at the time the edges of the two fractured parts were cut away preparatory to welding.

Blowholes in the weld are of course out of the question for a proper job, and means for completely venting the gases and filling the cavities with the liquid steel produced by the welding process, had to be provided. Two methods were



METHOD USED IN WELDING POROUS CAST STEEL STERN SHOE

possible. The steel casting could be cut off until the pockets were eliminated, then a small steel casting specially made and welded into place at the point where the material had been cut away.

The cost of the job was, however, materially reduced by adopting another method. Holes were drilled in the casting, as shown in the accompanying illustration, communicating with the internal pockets and connecting riser vents from these holes to the top of the mold. The left hand riser vent shown in the illustration was cut off before the picture was taken, but the dotted lines show the original location of the vent

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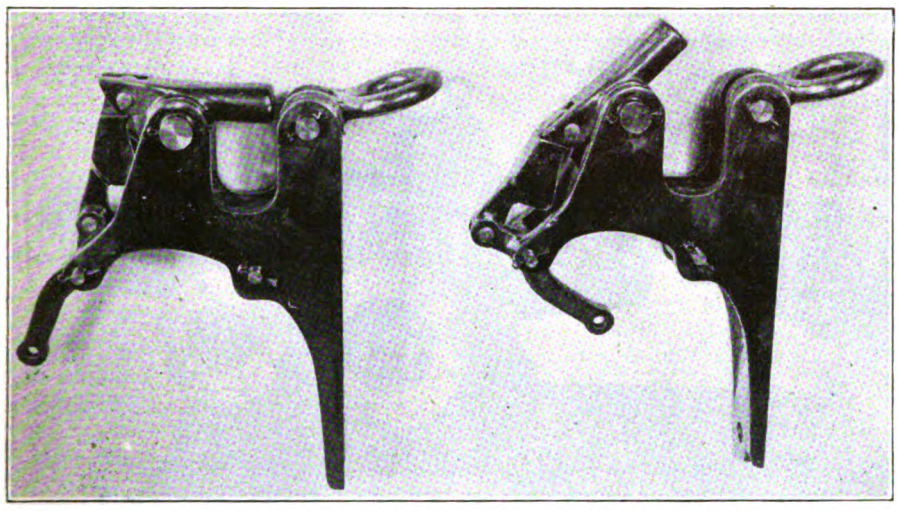
riser and the internal cavity. While ramming the usual mold around the fracture, the two drill holes were temporarily stuffed with waste from which connecting wooden patterns led up to the top of the mold. This method, it is stated, proved economical and worked successfully.

Invents Gear To Release Lifeboats Safely

Dr. Charles Hunt of Washington, has invented a detaching gear for lifeboats which provides an instantaneous means for releasing lifeboat falls either under normal conditions or when a ship is sinking. A special claim for the device is that a lifeboat may be released while the ship is traveling at 15 knots and the life boat is dragging through the water with the full strain on the releasing gear. The gear consists of three working parts, weighs 15 pounds and requires 3½ hours to make a complete installation. The body may be either a bronze or a steel casting in which are fitted a toggle jointed trip for releasing the falls, a trigger which actuates the toggle, a pulley over which the trigger line is led to the release lever and a shackle to which the boat painter may be attached. A safety lock prevents accidental release. In the accompanying illustration the releasing action of the device is shown.



AUTOMATIC RELEASING GEAR FOR SHIPS BOATS

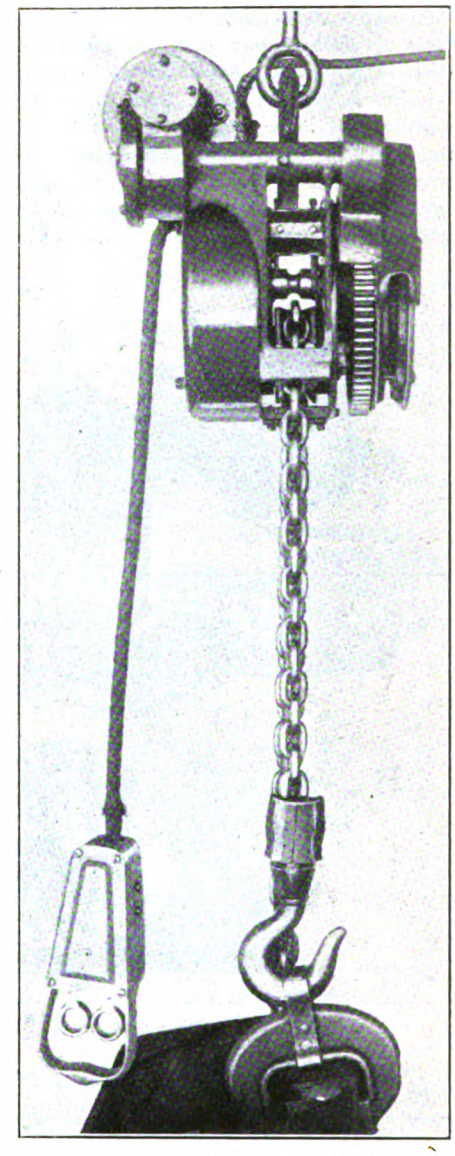
The release lever and drum controlled by one man are located along the thwarts of the lifeboat and the trigger lines lead through pulleys to the triggers of each device. The two gears are adjusted to release simultaneously and will so function under practically any condition of stress to which the ship may be subjected, it is claimed.

Tests have been made on the RICHMOND and the GENERAL RUCKER and were witnessed by representatives from the United States army, the British admiralty, the United States steamboat inspection service and from a number of steamship lines and shipbuilders. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has acquired the manufacturng and sales rights to this releasing gear and are now manufacturing sets for the United States coast guard vessels.

Builds New Motor Driven Chain Hoist

A motor driven chain hoist designed to perform operations lying between the field of the standard chain hoist and that of the traveling crane, has just been introduced by the Motorbloc Corp., Summerdale, Philadelphia. The accompanying illustration shows a front view of the hoist. The machine consists of a standard chain hoist of steel construction operated by the application of a specially designed heavy duty motor with well proportioned gearing and slip friction clutch applied by means of a malleable iron supporting bracket.

Care has been given to features of compactness, symmetry and balance. The armature shaft and worm are carried on heavy duty ball bearings with provisions made for automatic lubrication. The self-contained pendant controller is operated by the fingers of one hand, leaving the other hand free to guide the load. This arrangement makes it possible for one man to accomplish what would require two or more men for lifting and placing the same load. The new device is built light, the 1-ton size weighing 148 pounds. For occasional use at points where electric current is not available or in event of the temporary failure of electric power, the hand chain can be applied quickly and the hoist operated similarly to an ordinary block. While furnished as a complete hoisting device, the self-contained motor unit can be readily applied to the standard chain hoists already in service. Due to its real portability and the fact that it can be put into service with simple mechanical and electrical preparation, the crane is adaptable in terminals and warehouses.



COMPACT CHAIN HOIST WHICH IS MOTOR DRIVEN

In 1913, only 73 American ships entered Hongkong, their tonnage being 270,987. In 1920, these totals increased to 286 ships of 953,443 tons, dropping in 1921 to 241 ships of 863,673 tons. In the same years, British ships numbered 2101, 2090 and 2319 respectively, with tonnages of 4,215,369; 4,184,927 and 4,632,195. Japanese ships numbered 740; 925 and 1298 with tonnages of 1,907,307; 2,059,712 and 2,870,394. American shipping ranked sixth in 1913, and third in 1920 and 1921.

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New Type Multistage Centrifugal Pump

When an improvement is made, or new type developed, in an apparatus commonly used and well known, the presumption is that a solution is attempted for troublesome features in the usual design. It is generally known that a single stage centrifugal pump with double suction impeller is more efficient than the usual multistage single suction pump. On this account, where higher pressures are required than is practical for a single stage pump, instead of using the regular multistage pump, two separate single stage pumps are sometimes connected in series, so that one discharges into the suction of the other. This method has frequently been adopted, but the use of two independent pumps in series in medium and smaller sizes becomes rather cumbersome and the ordinary multistage pump, though less efficient, is more frequently used. The length of shaft permissible in a multistage pump is limited because of the critical speed, and where several stages are employed the designer is limited in the shape and size of water passages for highest efficiency.

The problem, therefore, resolved itself into the design of a multistage pump where the advantages of the single stage double suction impeller could be maintained if possible. To meet these requirements, the DeLaval Steam Turbine Co., Trenton, N. J., has developed a new type of multistage pump designated as a "series" pump based on the principles of the double suction impeller. In this pump, a specially formed casing provides for the suction inlet to deliver water to both sides of the impeller simultaneously, and for carrying this water around an individual snail-shaped passage known as a volute, which in turn delivers to both sides of the impeller at the suction inlet for the second stage and carried around a second individual volute in due course delivers to both sides of the impeller at the suction inlet for the third stage and so on to delivery. The individual snail-shaped passages or volutes are smooth and fair and are exactly proportioned for maximum efficiency. Intercommunicating spaces between the individual volutes are of ample proportions.

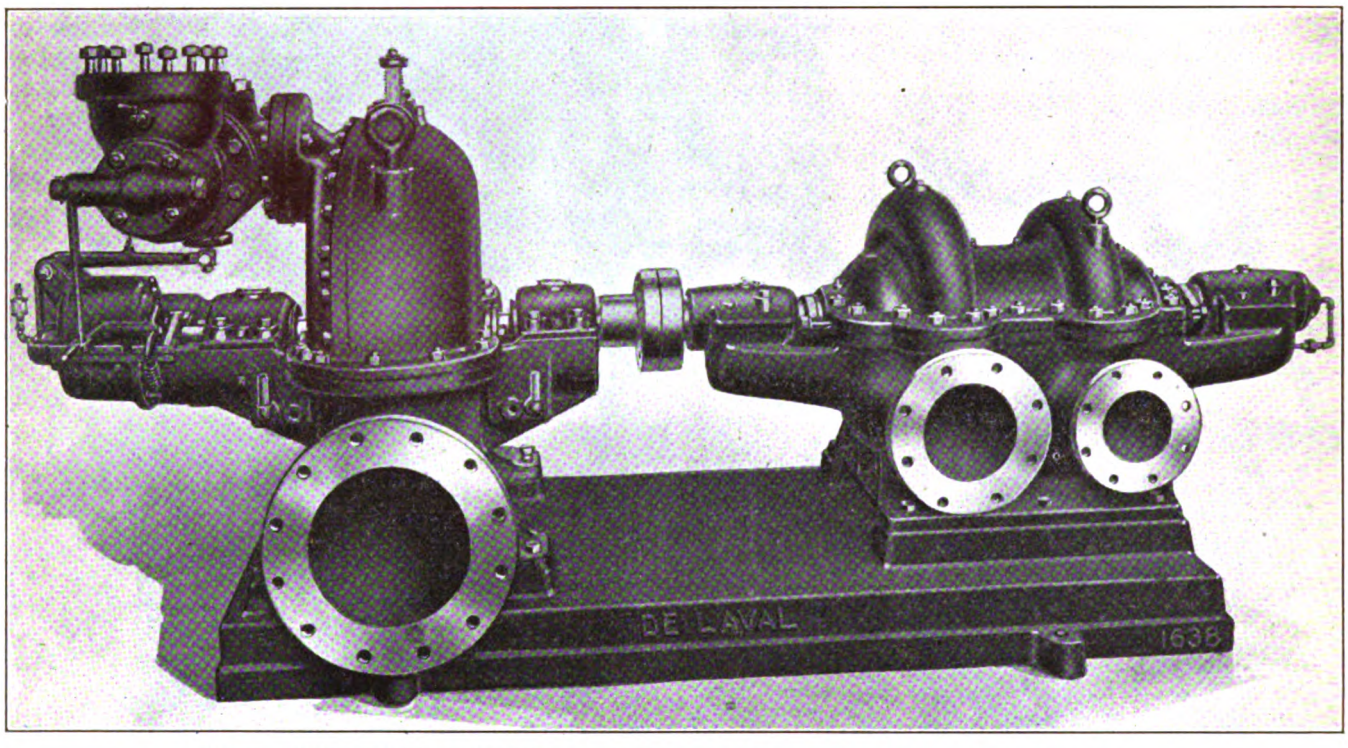

FIG. 1—MULTISTAGE CENTRIFUGAL PUMP SHOWING SIMPLICITY OF CONSTRUCTION

Advantages for this new "series" pump are claimed as follows:

1. Perfect hydraulic balance, and consequently no end thrust.
2. Two stuffing boxes and their friction eliminated.
3. A smaller suction eye than with a single suction impeller.
4. Impeller is of smaller diameter and, therefore, can operate at higher speed for a given head and capacity or for the same speed, head and capacity, giving higher efficiency.
5. The volute type of diffusor is not subject to clogging or rapid wear and gives a broader efficiency curve, a higher average over a wide range of delivery.

Referring to the accompanying photograph, Fig. 1, it will be noted that the pump casing is made in two parts divided on a horizontal plane through the center line of the shaft, with suction and discharge openings located in the lower half so that they are not disturbed when the casing cover is lifted. Labyrinth wearing rings as may be seen in the cross section Fig. 2, are fitted to prevent leakage from the discharge chamber of each impeller back to the suction chamber of the same impeller. One ring of each pair is the case protecting ring and is held in a recess in the casing and the casing cover. The other ring is the impeller protecting ring and is screwed to the impeller. By intermeshing, the grooves of the labyrinth rings present a long and tortuous path for water leaking from the discharge to the suction chamber, thus reducing leakage to a minimum while at the same time allowing for ample running clearances.

An indication of the effectiveness of this device in preventing leakage is the longer life of such rings as compared with the ordinary flat wearing rings. To prevent leakage from one stage to the other, the bushings where the shaft passes through the partition between stages are made extra long. Bronze sleeves are fitted to protect the shaft between the impellers and from the impellers to the outer ends of the stuffing boxes. The pump case and cover is fitted with bushings at partitions. Clearance is provided so that the shaft sleeve and pump casing bushings are not in metallic contact.

Improved efficiency by the series design is shown in the accompanying curves for a 5-inch pump, Fig. 3. A noticeable feature is the high efficiency maintained over a wide range of delivery. This characteristic, it is claimed, is due to the

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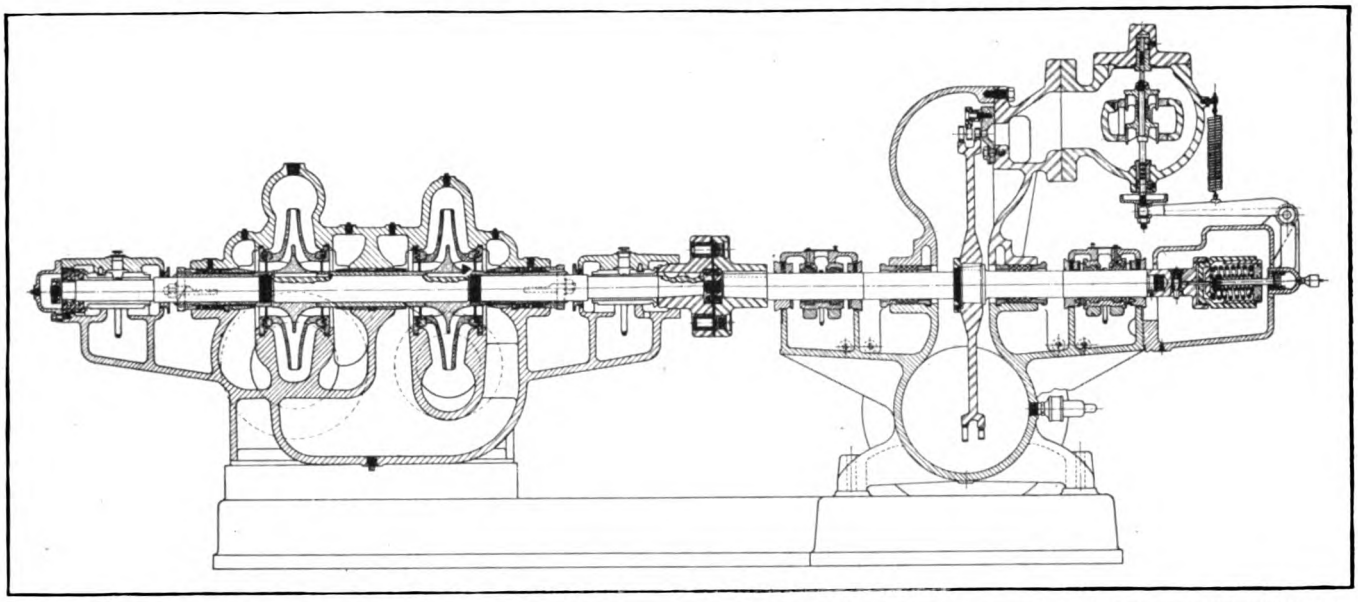

FIG. 2—SERIES PUMP COMPLETE WITH STEAM TURBINE FOR BOILER FEED FOR 1400 TO 2000 BOILER HORSEPOWER

greater efficiency of volutes over diffusion vanes for converting the velocity of the water leaving the impeller into pressure head.

In this manner, the advantage of the single stage double suction volute pump is extended to a multistage pump of two or three stages.

An important feature in the design is the accessibility and the low cost and ease with which repairs may be effected. All parts are made to limit gage sizes to insure fitting without machining. Places where wear occurs are protected by sleeves or bushings readily renewed. The casing is cast iron poured in dry sand molds to obtain smoothness and accuracy of internal passages. Impeller, wearing rings, shaft protecting sleeves and similar parts in contact with water are of bronze. The shaft is of steel and the bearings are babbitt lined.

Where It Is Used

For marine purposes, the series multistage centrifugal pump is particularly suitable for boiler feed service. The single stage centrifugal pump driven by a geared turbine is used for circulating condenser water and for pumping drydocks. As a fire pump, the multistage pump would work well. The delivery pressures in feet of head may be converted into pounds per square inch by dividing by 2.3. Compactness, efficiency, simplicity and reliability are factors advanced to recommend the new series pump for marine use. Its use in shore steam plants is definitely established. Limits of head are roughly about 200 feet per stage, and pumps are built with as many as three stages. A suction lift of 26 to 28 feet is possible though ordinarily 15 feet lift is customary. The pressures required vary from 100 pounds per square inch to 200 pounds per square inch.

Obituary

Myers L. Feiser, for six years a member of the editorial staff of the Penton Publishing Co., died at his home in Cleveland, Sunday, Dec. 31, after an attack of pneumonia of only a week's duration. Mr. Feiser was born at Bluefield, W. Va., April 13, 1891. He attended public school at Lima, O., and was in the class of 1914 at Wooster university. For a number of years he was engaged in newspaper work in Lima, Mansfield and Cleveland, after which he joined the editorial force in the Cleveland offices of the Penton Publishing Co. Following a period of about eight months, when he served on the staff of *Daily Metal Trade*, he went to Washington as correspondent for the Penton publications. In this position he kept in touch with the activities of the various marine and iron and steel committees and dollar-a-year men assembled in Washington during the war period. He made a wide acquaintance among members of the marine and steel industries and won the commendation of the chairmen of several committees for his co-operation with them. When the wartime organization in Washington was disbanded, he returned to the Cleveland office of the Penton Publishing Co., where up to the time of his death, he was engaged in editorial work for MARINE REVIEW and the *Iron Trade Review*. Mr. Feiser was a member of Phi Gamma Delta fraternity and was active in college alumni and fraternity activities.

The captain and crew of the schooner GORDON FUDGE, of St. Johns, N. F., which became waterlogged about a thousand miles off the American coast, were rescued by the British steamship MENOMINEE. The schooner was caught in the December gales.

The shipping, engineering and machinery exhibition will be held in London from Aug. 31 to Sept. 13, 1923.

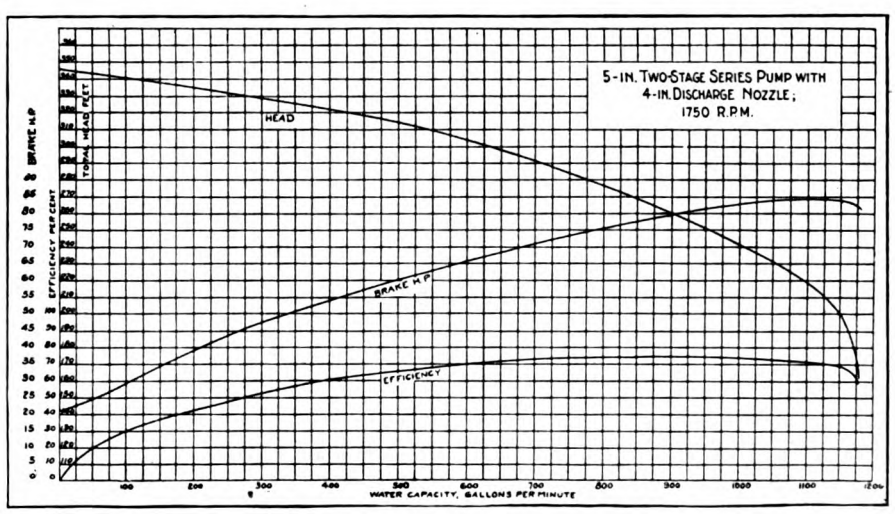

FIG. 3—PERFORMANCE CURVE SHOWING EFFICIENCY MAINTAINED OVER A WIDE RANGE OF DELIVERY

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New Ships Ordered from Pacific Yards

The Whidby Island Navigation Co., Everett, Wash., has called for bids for a wood automobile and passenger ferry, 120 feet in length, 33 feet beam and 6 feet draft. The vessel is to be ready by April 1. Space will be provided for 25 cars and a 10-ton elevator will be installed to raise and lower automobiles. A 500-horsepower steam engine is expected to develop a speed of 12 miles an hour. There will be accommodations for 600 passengers.

Contract for constructing an automobile ferry to be operated between Bellingham, Wash., and Vancouver island by the Canadian Pacific has been awarded to Yarrows, Ltd., Victoria, B. C. It is understood that the craft will be powered with McIntosh-Seymour diesel engines, twin-screw, of 1200 horsepower. She will be delivered early in May. The original plans for a steel hull have been changed and wood will be used instead. The speed will be 14 knots. The dimensions are 170 feet length, 43 feet beam and 11 feet depth.

First of three scout cruisers built for the navy by the Todd Drydock & Construction Corp., Tacoma, Wash., the OMAHA, will be ready for delivery to the government within a short time. The OMAHA had her preliminary tests in Puget sound waters recently and according to unofficial reports made a satisfactory showing. With fire under only half of her battery of boilers, the new cruiser steamed 20 knots an hour. The two sister ships are coming along rapidly and they will be delivered during the coming year. At this yard, work has been commenced on the new steel steamer ALASKA, to be constructed for the Alaska Steamship Co.

Port of Portland officials declare that their new port dock established a Portland record when it lifted the shipping board steamer PAWLET in which were 4000 tons of cargo. The total weight is estimated at 10,000 tons. The new dock's capacity is 15,000 tons and no difficulty was experienced in lifting both ship and cargo.

The PAWLET underwent extensive repairs to hull.

Resumption of work on the Esquimalt, B. C., drydock has been ordered by the federal minister of public works. The dock is expected to be completed in June, 1924, at a cost of $1,500,000. Tenders for $500,000 worth of operating equipment will be invited in the near future.

Todd Dry Docks, Inc., Seattle, recently completed extensive repairs to the freighters STUART DOLLAR and BESSIE DOLLAR, both of which were disabled at sea.

In addition, the yard at the present time is handling considerable routine docking and repair work.

The coasting steamer WILLIE A. HIGGINS, seriously damaged by fire at Blaine, Wash., has been towed to Seattle for repairs.

American repair yards and drydocks on the Pacific coast are greatly pleased with a new tariff regulation which imposes a duty on equipment and repairs obtained in foreign ports by American vessels. British Columbia competition has been keen on the Pacific, especially when Canadian money was at a discount. The new law is expected to benefit yards in the United States.

Two suits seeking damages aggregating approximately $307,000 have been filed by the Astoria Marine Iron Works against the shipping board. The action follows the cancellation of war contracts for the fitting out of 27 government hulls. Plaintiff alleges loss of profits and asks for reimbursement for expenses incurred in partially filling its contracts up to the time the government ordered work stopped. The contracts included furnishing and installing machinery and equipment.

Launch Special Ship for Coast Trade

THOUGH the American merchant marine was built up to great proportions during and shortly after the war, the unusual or special type of ship received practically no attention and no ships not directly needed in the emergency were authorized. This is why some of the long established steamship lines are carrying out plans, in some cases deferred on account of the war, for renewals of obsolete units or for additions to their fleet to meet the natural growth of their business. Conversion of some of the over supply of cargo ships to suit special needs may be practicable in some instances if they are to continue as cargo carriers. It is clear, however, from present demands that it is the combination cargo and passenger vessel which is needed and in this case the only practical solution is to build to order the type proved by experience as best fitted for the service intended.

For that reason, more than ordinary interest attaches to the launching on Dec. 22, 1922, of the ALLEGHANY, building for the Merchants & Miners Transportation Co. at the Federal Shipbuilding Co., Kearny, N. J. The sponsor was Mrs. Sophie Meredith Joyce. This vessel is the first of two sister ships under construction at this yard. The second will be ready to launch in about one month.

The accompanying photographs indicate the degree of completion at the time of launching. The ALLEGHANY is a 12-knot single screw elliptical stern cargo and passenger ship with characteristics peculiar to the ocean coastwise service. The dimensions and particulars follow:

Hull

Length, overall, in feet, inches	368 0
Length, between perpendiculars in feet, inches	350 0
Breadth molded in feet, inches	52 0
Depth molded in feet, inches	27 3
Draft loaded in feet, inches	19 0
Framing—Isherwood	
Class	+ A1E
Displacement in tons	6950
Gross register tonnage estimated	5500

Propelling Machinery

Boilers, 4 single ended Scotch 14 feet 3 inches long, 11 feet diameter, 3 furnaces to each boiler, forced draft.

Fuel, oil, convertible to coal.

Heating surface, total in square feet	9216
Superheat, none.	
Working pressure, pounds per square inch	200
Normal fuel consumption per day in tons	35.9
Consumption per horsepower hour, pounds	1.24
Normal steam, production per hour per pound of fuel, in pounds	13.7

Engine, one 4-cylinder triple expansion reciprocating size, 24½ X 41½ X 2-54 inches with 48-inch stroke.

Horsepower, indicated	2200
Propeller, one solid cast steel 4 blades, diameter, feet, inches	16 6

Refrigerating Machinery

One Brunswick, capacity tons 2

Electrical Equipment

2—50 kilowatt 115 volt, D. C.
1—2 kilowatt set for radio.
1—15 kilowatt 115 volt. D. C.—Emergency.

Deck Machinery

1—9 x 9-inch steam steerer
1—Hyde windlass 9 x 10 inches, spur geared
1—Hyde capstan steam dock 8 x 8 inches

Cargo Handling Hatches, Masts and Winch

Holds—No. 1—52 feet long, No. 2—71 feet long, No. 3—107 feet long.

Hatches—No. 1—13 x 17 feet, No. 2—13 x 16 feet, No. 3—12 x 16 feet, No. 4—13 feet 6 inches x 16 feet

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Masts—two steel, main mast 59 feet—foremast 55 feet
Winches—ten 8 x 8-inch friction drum

Crew and Passengers

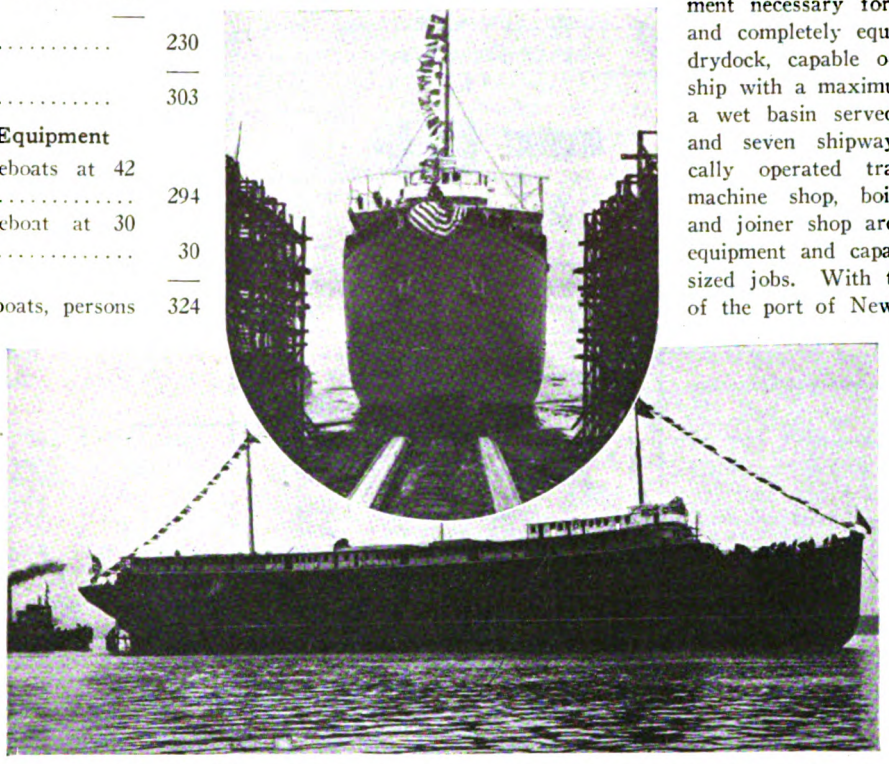
Deck officers	4
Deck crew	18
Engineer officers	5
Engineer crew	13
Purser and steward's dept.	33
Total crew	73
First class passengers	206
Third class passengers	24
Total passengers	230
Total complement	303

Life Saving Equipment

7 26-foot metallic lifeboats at 42 persons	294
1 26-foot power lifeboat at 30 persons	30
Total capacity in lifeboats, persons	324

The ALLEGHANY and her sister ship not yet launched are being built to the highest class, American Bureau of Shipping, from designs by and under the supervision of J. M. Ferguson, naval architect for the Merchants & Miners Transportation Co. Passenger accommodations are fitted with particular care for comfort and convenience. The joiner work will be of the highest class. Public rooms will be well finished, spacious and tastefully decorated.

Building an entirely satisfactory passenger ship is much more difficult than an ordinary cargo ship due to greater detail and the nice workmanship and finish required for passenger accommodation. It may, therefore, rightly be considered a mark of confidence on the part of the owners in placing the contract for two of this type with the Federal Shipbuilding Co., as this company is comparatively new.



COMBINATION CARGO AND PASSENGER CARRIER ALLEGHANY AFTER LAUNCHING AT KEARNY YARD

This company is now the only active shipyard in Newark bay, and is located within two hours towing of New York harbor. At present the yard has orders for or has under construction, the two passenger and cargo vessels referred to, two car floats, one drill boat, the E. R.-1 for the United States engineers, two diesel drive cargo boats for the Great Lakes and Atlantic ocean trade, besides several repair contracts. Every department necessary for shipbuilding is fully and completely equipped, with a floating drydock, capable of lifting a 10,000-ton ship with a maximum length of 460 feet, a wet basin served by a 100-ton crane and seven shipways served by electrically operated traveling cranes. The machine shop, boiler shop, plate shop and joiner shop are all fitted with latest equipment and capable of handling large sized jobs. With the anticipated growth of the port of Newark as a terminal for the vast rail systems centering in this part of New Jersey, the strategic location of the Federal Shipbuilding Co. between this port and New York harbor can readily be appreciated. The plant is one of two opened during the war by the Steel Corp. one at Mobile, now being used for car building.

New Vessels for Savannah Line

CONTRAST between the peak of war shipbuilding activities and the low point of today, tends unfairly to minimize the importance of the building now under way and of orders recently placed. In spite of the fact that many comparatively new ships are now idle, ships of special design for particular services are needed and must be built.

Of unusual interest is the order placed recently by the Ocean Steamship Co., Savannah, Ga., with the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., for two steel steamers, larger but generally similar to its CITY OF ST. LOUIS and CITY OF MONTGOMERY. This contract while indicating that the need for vessels of special type exists shows also the growth and expansion of an old established coastwise passenger and freight line.

The Ocean Steamship Co., generally known as the Savannah line, was founded in 1872 by William M. Wadley, railroad president and banker of Savannah. The following six steamships were acquired from William R. Garrison, New York, in March of that year:

	Gross tons
GENERAL BARNES	1254
HERMAN LIVINGSTON	943
MAGNOLIA	1215
SAN SALVADOR	971
SAN JACINTO	1312
RAPIDAN	1868
Total	7563

In August, 1872, a charter was obtained from the state of Georgia authorizing the formation of a steamship company, and immediately thereafter the Ocean Steamship Co. was organized. The public had no confidence in the project and the entire stock issue had to be taken up by Mr. Wadley and his associates.

From the beginning, the policy of the company has been to maintain the prestige of Savannah as one of the great maritime ports of the world. As the city grew and prospered, so did the Ocean Steamship Co. which added to and improved its fleet and enlarged its terminal facilities by the extension of wharves, piers and docks. The trade and travel between the north and south steadily increased. Nine years after the formation of the company, the gross tonnage of the fleet had grown to 13,390, nearly double, in 1900 it was 21,737, and in 1917, when the last additions were made it had become 45,468. During the war, contracts were placed for three new ships of a total gross tonnage of 18,985. These, however, were commandeered by the government while under construction and were never placed in the trade. The following ships are now

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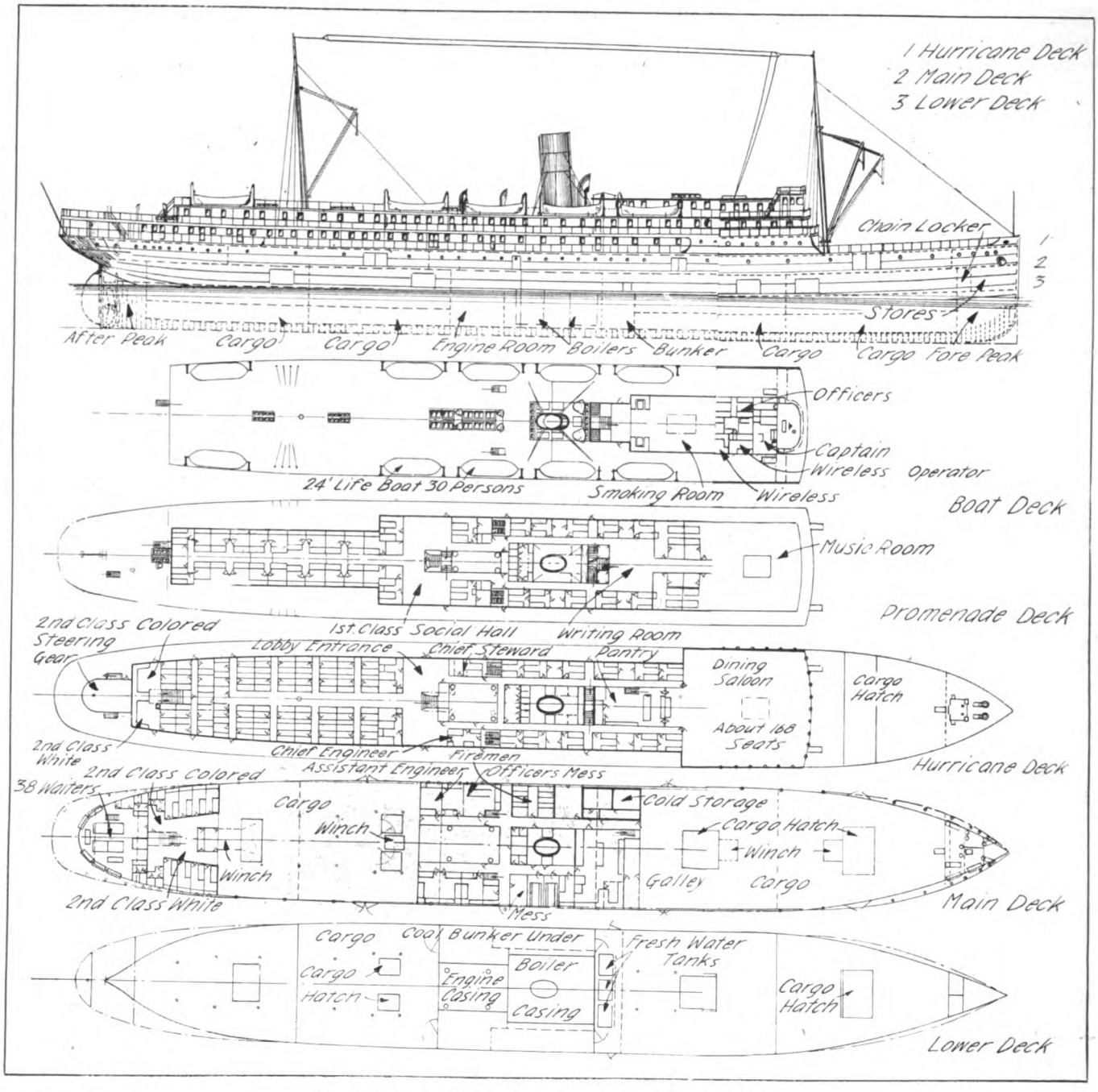

SAVANNAH LINE—PASSENGER AND CARGO SHIPS

General Arrangement and Deck Plans of the Savannah Line's Two New Combination Passenger and Cargo Vessels, Building at Newport News Shipbuilding & Drydock Co. They Will Be Ready for Service in September and October, 1923

operated by the company between Savannah and New York and Savannah and Boston:

	Gross tons
City of St. Louis	6200
City of Montgomery	6200
City of Savannah	5900
City of Atlanta	5433
City of Columbus	5433
City of Rome	3648
City of Augusta	2870
Nacoochee	2680

The two new ships now building at Newport News are to be delivered in September and October, 1923. They are to burn coal and are designed for a speed of 12½ knots on a load draft of 18 feet 6 inches.

The general arrangement and deck plans are shown in the illustration. The dimensions are:

	Feet	Inches
Length over all, about	400	0
Length between perpendiculars	382	0
Beam molded	52	0
Depth molded to hurricane deck	35	0
Depth molded to main deck	27	0
Depth molded to lower deck	18	6
Depth molded to orlop deck	10	6
Load draft about	18	6

Deadweight: Including cargo, coal, water, passengers, crew and stores, tons..... 3500

Stability: To have sufficient metacentric height to insure stability between light and load draft with no other than regular water ballast in double bottoms.

The vessels will be steel hull, transverse frame construction, single screw passenger and freight steamships of the hurricane deck type, straight stem, elliptical stern, two steel pole masts, schooner rigged. They will have the highest class in the American Bureau of Shipping. The orlop, upper 'tween, main, and hurricane decks will be steel and the promenade and boat decks Oregon pine.

The continuous deckhouse on the hurricane and promenade decks may necessitate fitting expansion joints in these decks at some point amidship. The double bottoms will extend from fore peak as far aft as possible and will be divided into compartments. The compartments under engine and boiler rooms

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are to carry reserve feed water. Total capacity of double bottoms is to be not less than 800 tons.

The hull is divided into seven watertight compartments as follows; fore peak, two cargo holds forward, machinery space and bunker, two cargo holds aft and after peak. The fore peak bulkhead will extend to hurricane deck and all other watertight bulkheads to the main deck.

The propelling machinery and boilers will be located amidship with a non-watertight bulkhead dividing the engine and boiler rooms. The four main boilers are arranged in batteries of two each with a common athwartship fireroom and all boilers are connected to one stack.

A single main engine, inverted direct acting triple expansion, surface condensing, three crank with cylinders 26 x 43 x 72 inches in diameter by 48-inch stroke, working at a steam pressure of 200 pounds per square inch will develop a total of 2900 indicated horsepower at not exceeding 75 revolutions per minute. Air and two bilge pumps only are attached to the crosshead of the main engine. Other pumps are independent.

The main condenser has 4100 square feet of cooling surface and the auxiliary condenser 450 square feet of cooling surface. The main circulating pump is a centrifugal double suction type, 14-inch diameter, steam driven. Other pumps include two vertical simplex circular pot valve Weir type feed, 14-inch diameter steam, 9-inch diameter water and 24-inch stroke; two fire bilge and ash ejector pumps, 12 x 8½ x 12 inches, vertical duplex, admiralty pattern; one ballast pump, vertical duplex 7½ x 9 x 10 inches; one sanitary pump, vertical duplex 12 x 8½ x 12 inches; one fresh water pump, vertical duplex 6 x 6 inches; drinking water pump, 3 x 2 x 3 inches horizontal duplex; one ammonia condenser circulating pump and two brine circulating pumps.

The propeller is a right hand true screw of about 16 feet diameter and suitable pitch. It has a cast iron hub with four manganese bronze blades attached to the hub by steel studs and composition cap nuts with bronze set bolts. Propeller is held in place by a steel feather and wrought steel nut protected by a cast iron cap. Two spare propeller blades and seven studs and nuts will be supplied.

The four boilers are single ended cylindrical return tube type, 14 feet 9 inches in diameter and 11 feet 6 inches long outside. They will comply with the American Bureau of Shipping rules and of the United States steamboat inspection rules for a working pressure of 200 pounds per square inch. They will burn coal under natural draft.

These vessels will maintain at sea under ordinary conditions 12½ knots on a mean draft of 18 feet 6 inches. The consumption at 12½ knots is not to exceed 50 tons of coal per 24 hours. They will have a dock trial and a 6-hour sea trial under full power without cargo but with full ballast tanks.

Bunkers are fitted under deck abreast of the boilers with a cross bunker forward of the boiler room. Total capacity of the bunkers will be about 550 tons.

The refrigerating plant will be on the port side between the main and hurricane decks. It will be approximately 13 x 25 feet. One 4-ton service and one 4-ton space refrigerating machine will be used.

For cargo handling, four cargo ports will be provided on each side between the lower and main decks, with watertight sliding doors. Three cargo ports will be on each side between the main and hurricane decks with hinged watertight doors. No. 1 hatch will be on the center line to the forward hold through all decks to the hurricane deck. No. 2 hatch will reach hold No. 2 on center line through orlop, lower and main decks only. At No. 3 hold, one set of blind hatches in pairs will straddle the shaft alley extending to the main deck. In No. 4 hold, one hatch will be on the center line through the main and lower decks and a pair of hatches through the orlop deck straddling the shaft alley. Two 15-ton booms will be set on table on the forward side of the foremast for No. 1 hatch, and will be served by one double drum winch on the hurricane deck forward of mast. Two cargo cranes will be served by one winch for No. 2 hold; similar cargo cranes for after holds on the main deck, each set of hatches served by one winch. One 5-ton boom will be on the main mast with lead from the winch at No. 4 hatch for handling cargo through the after ports.

Fresh water tanks of 10,000-gallon capacity will be located on the lower deck under the galley. Natural ventilation will be provided by means of trunks and cowls.

Arrangement for Passengers

Accommodations for 164 first class passengers are called for. The steel house on the hurricane deck has 42 rooms for 84 first class passengers. Two of these rooms are large and have private bath. Special bathrooms connect with the staterooms amidship. Dining saloon seats 168 people. On the same deck are the lobby, pantry, public baths and toilets, chief steward, chief engineer, second steward, stewardess and, at the after end, second class passenger staterooms.

On the promenade deck is a wood house containing observation room, lounge, writing room, 40 staterooms for 80 first class passengers. Eight of these are large bedrooms with private baths. Four special bathrooms are provided for amidships staterooms. Public baths and toilets also are to be installed.

On the boat deck is a wood house containing pilot house, captain and officers' quarters, wireless room, quartermasters' room, smoking room and deck entrance.

On the main deck, the after end is fitted for second class passengers. Thirty eight waiters are berthed aft of the second class quarters. Seamen will be berthed forward on this deck.

Orders for 11 Ships

BELOW are given orders for new ships awarded during the past month and new business on which bids are asked and projected. Actual awards to American yards include 11 vessels, the most important being a 550-foot self-unloader booked by the American Shipbuilding Co., and two diesel-electric driven salt and fresh water freighters taken by the Great Lakes Engineering Works.

SHIP CONTRACTS PLACED

Canadian Pacific railroad, automobile ferry, diesel driven, 170 feet long, 43 feet beam and 11 feet depth, wood hull, to Yarrows, Ltd., Victoria, B. C.

Eastern Steamship Co., backed by Buffalo interests, placed orders on Clyde for 10 Welland canal size steamers for service in canal and St. Lawrence river trade.

Bradley Transportation Co., Rogers City, Mich., self-unloader for coal and stone trades, 550 feet long, 60 feet beam and 32 feet deep, a duplicate of CARL D. BRADLEY. Carrying capacity 10,000 tons. Awarded to American Shipbuilding Co., for construction at Lorain, O.

National Contracting Co., four barges for service on Ohio river, to the Independent Bridge Co.

Philadelphia & Reading railroad, two steel car floats to Sun Shipbuilding Co., Chester, Pa.

Philadelphia & Reading railroad, two wooden car floats to Mathis Shipbuilding Co., Camden, N. J.

McDougall Terminal Warehouse Co., Duluth, two steel freighters, Welland canal size, for service also on barge canal and Atlantic ocean to West Indies, diesel electric driven, to Great Lakes Engineering Works, Ecorse, Mich.

SHIP CONTRACTS PENDING

Whidby Island Navigation Co., Everett, Wash., wood automobile and passenger ferry, 120 feet long, 33 feet beam, 6 feet draft, to carry 25 cars and 600 passengers. A 500-horsepower engine will give a speed of 12 miles.

Reiss Steamship Co., Cleveland, bulk freighter, 600 feet long, 60 feet beam, 32 feet depth, 13,000 ton deadweight, bids asked.

Cleveland & Buffalo Steamship Co., Cleveland, plans drawn for side wheel passenger carrier, intermediate size between CITY OF BUFFALO and SEEANDBEE.

Great Lakes Steamship Co., Cleveland, will rebuild two of its vessels.

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Activities in the Marine Field

Latest News from Ships and Shipyards

Start Repair Work on Lake Ships

WITH the 1922 season passed into history, lake activities are at a standstill. Most of the operators have left on extended vacation trips. Both major and minor repair work on the vessels is, of course, going on and will continue throughout the winter in order to have the fleet at maximum efficiency when the new 1923 season opens. Last year wound up short of the possibilities held out earlier for a rush of profitable contracts. Iron ore with shipments more than double the previous year, was in constant demand throughout the year. Coal was a disappointment due to the strike which delayed shipments for several months and compressed shipments into the busy fall months. Grain was freely offered but railroad congestion delayed boats at the unloading elevators while early storms in December shut off the late movement.

* * *

Reports of the United States engineer for the Duluth-Superior district show that 9106 vessels of all kinds entered and cleared that port, the tonnage being 32,347,589. Exclusive of tugs, derrick scows, etc., the number was 8002 of 32,284,892 tons or an average of 4035 tons. The increase in freight tonnage handled in 1922 was 166 per cent over 1900, 4 per cent over 1910 and 27 per cent over 1921. Coal receipts dropped 44 per cent from 1921. The navigation season for interlake traffic covered a period of 237 days, from April 21 to Dec. 13.

* * *

The Wisconsin Steel & Dock Co., Milwaukee, has taken over the plant of the Milwaukee Marine Repair Co., Milwaukee, and will operate it. This purchase gives the company extended facilities for handling marine construction and repair work. J. J. Cato has charge of the mechanical department and F. W. Stevens of the hull department.

* * *

The Beaver Island Transportation Co., Charlevoix, Mich., has sold out to Harry L. Oldham, the chief stockholder. The sale covers the steamer BRUCE carrying mails, freight and passengers from Charlevoix to St. James, Beaver Island.

* * *

Ferry service between the American and Canadian cities at the Soo was discontinued Jan. 10 as the ice was too heavy.

* * *

Capt. James Doner has been appointed superintendent of the Reiss Steamship Co. and the Rockport Steamship Co., with headquarters at Cleveland. Shipbuilders have been asked for bids on a 600-footer for the Reiss interests which if ordered will give that company nine steamers. The Rockport company operates the new self-unloader JOHN A. KLING, built at Manitowoc and delivered last October.

* * *

The steamer CADILLAC of the Cleveland-Cliffs Iron Co. is being reconstructed at Ashtabula, O. She will have new arches, side tanks and tank tops and the hatches will be enlarged.

* * *

The steamer THUNDER BAY, which grounded late in the season, has unloaded her cargo of grain and is in the Buffalo repair dock. Besides internal damage, 71 plates will be taken off and 23 faired in place.

* * *

Bamlet Kent, aged 54, district manager of the Duluth-Superior Dredging Co., died at Detroit Jan. 11 from apoplexy. He was widely known throughout the cities of the Great Lakes region because of his activities in dredging work. He was a graduate of the Michigan School of Mines and entered the United States government service as an engineer. He was identified with most of the marine engineering work in the Detroit district in recent years.

* * *

The United States lake survey reports the monthly mean stages of the Great Lakes for the month of December, 1922, as follows:

Lakes	Feet above mean sea level	
	November	December
Superior	602.35	602.08
Michigan-Huron ..	579.54	579.15
St. Clair	574.21	574.12
Erie	571.41	571.13
Ontario	245.15	244.64

Lake Superior is 0.27 foot lower than last month, 0.09 foot higher than a year ago, 0.3 foot below the average stage of December of the last 10 years, 1.05 feet below the high stage of December, 1916, and 0.88 foot above the low stage of December, 1879.

Lakes Michigan-Huron are 0.39 foot lower than last month, 0.39 foot lower than a year ago, 1.02 feet below the average stage of December of the last 10 years, and 3.43 feet below the high stage of December, 1876.

In the North Atlantic

INDICATIVE of the increasing importance of repair work at its yard following a considerable addition in equipment to carry on all kinds of work of this nature, an application has been filed by the Sun Shipbuilding Co., Chester, Pa., for change in name to Sun Shipbuilding & Drydock Co., and for an extension of its charter to include the manufacture of oil engines.

* * *

R. H. M. Robinson, president of the Merchants Shipbuilding Co., and chairman of the executive committee of William Cramp & Sons Ship & Engine Building Co., announced early in January that the Merchants Shipbuilding Co., at Chester, Pa., is to be closed and the allied companies' shipbuilding activities will in the future be centered in Philadelphia at the Cramp yards. Both of these concerns are controlled by the American Ship & Commerce Corp., a part of the Harriman interests. This action will tend to place ship construction in the Philadelphia district on a permanent peace time basis. Though no decision has been reached as to the disposal of the Chester plant, Mr. Robinson pointed out its advantages of deep water frontage on the Delaware river and its excellent railroad terminal facilities as ideal for an industrial plant. The Chester plant is fully equipped as a modern shipyard, and has seven ship ways. It was formerly known as the Chester Shipbuilding Co., and was a revival of the old Roach yard founded by John Roach more than 50 years ago.

* * *

Capt. J. B. Parse has been appointed one of the pilot commissioners for New York in place of C. O. Norton, resigned. There are in all five commissioners, three appointed by the chamber of commerce and two appointed by the board of underwriters. Captain Parse was formerly master of the American Hawaiian freighter TEXAN and is now a surveyor for the Insurance Co. of North America.

* * *

In 1922, the International Mercantile Marine Co. earned its bond interest and taxes and a substantial share of the depreciation for the year, but the estimate shows no surplus for dividends. After consideration of the affairs of the company, the directors decided to declare a dividend on 1½ per cent on the cumulative preferred stock, payable from accumulated surplus.

* * *

While docking in a gale on Dec. 22, the White Star liner MAJESTIC was blown out of her course and collided with the Cunarder BERENGARIA damaging two plates in the starboard quarter. The damage was comparatively slight and the

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BERENGARIA sailed as scheduled the day following the accident.

* * *

The MEXICO of the Ward line damaged, on Dec. 14, in collision with the Old Dominion Line steamer HAMILTON, was towed to Robins drydock, Erie Basin, New York, for repairs. Officials of the line estimate repairs at $25,000.

* * *

The British freighter BRISTOL CITY outbound collided with the JANETA off St. George, Staten Island. Several plates in the BRISTOL CITY were damaged and she was forced to put in to her pier as the water was leaking into her forehold. The collision was said to be due to a mistake in signals.

* * *

One hundred and twenty passengers were safely landed from the PROSPERO which ran aground off the coast of Newfoundland, Dec. 16. The vessel owned by the Newfoundland government was refloated with two holds damaged.

* * *

Launching in Hamburg at the shipyard of Blohm & Voss of the new transatlantic liner ALBERT BALLIN for the Hamburg American line is an indication of the steady recuperation of the German marine. She is expected to enter the service between Hamburg and New York via Southampton and Cherbourg in May. A sister ship the DEUTSCHLAND now under way will be completed later in 1923.

* * *

A change in the name of the former German liner PRESIDENT GRANT to that of PRESIDENT BUCHANAN was announced by the shipping board. She will be reconditioned and added to the services of the United States lines. Her sister ship, the PRESIDENT LINCOLN, was sunk during the war by a German submarine.

* * *

On Nov. 14, the White Star liner PITTSBURGH bound from New York to Bremen exhibiting splendid seamanship, rescued the entire crew of 45 men from the MONTE GRAPPA bound from Montreal to Trieste. The MONTE GRAPPA was abandoned as a derelict.

* * *

Munson line steamers are to make monthly stops at Santos going south in addition to present regular stops of all their ships coming north.

* * *

Charges for docking privately operated vessels in the huge South Boston naval drydock have been reduced 3 cents per ton, effective Jan. 1. Formerly the charge was 15 cents per gross ton for docking and undocking and 13 cents per gross ton for each lay day after the first 24 hours. The rates now in effect are 12 cents per gross ton for docking and undocking and 10 cents per ton for lay days. These rates are applicable for steamers, while on sailing vessels the tonnage rates are the same, but are based on the net tonnage.

* * *

Patterson, Wylde & Co., resumed their service from Boston to Havre and Dunkirk with a sailing from Boston about Jan. 13. The service from Boston to Amsterdam and Rotterdam was discontinued after the sailing of the steamer EGLANTINE recently.

* * *

The Garland Steamship Corp. is placing seven of its first class steamers in intercoastal trade. They are NORLINA 7300 tons, CAROLINIAN 7000 tons, WILLIAM PERKINS 8800 tons, JAMES B. DUKE 9030 tons, GEORGE ALLEN 9050 tons, ALBERT JEFFRESS 9020 tons, and WILLIAM CAMPION 9030 tons. The ports of call are to be New York, Baltimore and Norfolk, Los Angeles, San Francisco, Seattle and Portland.

* * *

The Hamburg-American line will place the new 9000 gross ton steamer THURINGIA in the Hamburg-New York service sailing from Hamburg on her initial trip on Jan. 18. This vessel has accommodations for 150 cabin and 750 third-class passengers. She will replace the WUERTTEMBERG which will be transferred to the German South American service. The WESTPHALIA, a sister ship, will be ready for the New York run early next year.

Up and Down the Pacific Coast

ANNOUNCEMENT by the Admiral-Oriental line states that hereafter the transpacific vessels operated by that service will be completely manned by white crews. Heretofore it has been customary to use Chinese in some of the departments, especially as stewards, firemen and oilers.

* * *

Port development at Bellingham and Blaine, Wash., has been endorsed by the voters at a recent election. Plans are now being prepared for the first units of extensive port facilities, increasing water shipments having emphasized the inadequacy of present terminals.

* * *

By agreement among the dock operators of Seattle free time on intercoastal piers has been reduced from ten to five days. This arrangement is in line with the policy prevailing at the railroad water terminals.

* * *

The Alaska Steamship Co. has purchased from the shipping board the steel steamer DELROSA, sister vessel of the MEDON, recently acquired by the same owners. Both vessels are to be used in the Alaska trade for which they are well adapted. The DELROSA is at present operating on the run to Peru and Chile.

* * *

The port of Coos Bay (Oregon) has authorized an issue of $50.000 in bonds to provide funds for purchasing machinery for the port dredge extension of the port pier and other terminal improvements. Contract has also been awarded for the construction of 24 pontoons as part of the equipment for the port's suction dredge.

* * *

The ocean going steel tug HUMACONNA has arrived at Seattle, her future headquarters, from the Atlantic where she was purchased from the shipping board. The HUMACONNA was bought by the Cary-Davis Tug & Barge Co., for use in north Pacific waters and is said to be admirably adapted for the purpose. The tug was built at Superior, Wis., in 1919. Her new owners brought her from the Atlantic to meet the competition of San Francisco interests who recently invaded Puget sound with one of their large tugs.

* * *

Regular refrigerator service between north Pacific and Atlantic ports was inaugurated with the arrival of the steamer NEPONSET for which the Admiral-Oriental line was appointed Puget sound agent.

* * *

Longshoremen working cargo aboard shipping board vessels at Portland, Oreg., are hereafter to be employed on an open shop basis according to recent announcement. The company holding the government contract has established a hiring office. The Waterfront Employers' association at Portland is still maintaining its hall where men are employed regardless of their union affiliations. Efforts of union officials to hold a conference with waterfront interests have been unsuccessful and it is announced that hereafter Portland is to be strictly open shop.

* * *

Several steel steamers of the Lake type, purchased by lumber shippers from the shipping board, have entered the coasting service between Washington, Oregon and California ports. These vessels, with slight alterations, have been found admirably adapted for the lumber trade and other firms are contemplating purchases of similar vessels.

* * *

After more than 25 years of service as an army transport, the steel steamer DIX has been purchased by the Robert Dollar Co. and will likely be used in the transpacific service. The DIX, formerly a British freighter, operated for years from north Pacific ports to Hawaii and the Philippines.

* * *

The E. K. Wood Lumber Co. has taken delivery of the steamer LAKEBRIDGE, purchased from the shipping board. She will be used in the Pacific lumber trade as is a sister vessel, the LAKE SHORE, recently brought out from the Atlantic.

* * *

North Pacific ports have filed emphatic protest against the system of the shipping board in the compilation of shipping statistics. Under existing ar-

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rangements, California ports are said to receive credit for much of the cargo loaded and discharged at Columbia river and Puget sound ports as vessels frequently make initial entry or final clearance from California ports. This system, it is held, works an injustice and the board is asked to give each port credit for the business passing over its terminals.

* * *

The Washington Tug & Barge Co., Seattle, has purchased the Ferris-type wood hulls PUYALLUP, OELWIN and AHMIX and will convert them into barges. Similar disposition will be made of the schooner WILLIAM NOTTINGHAM which has been purchased by the same interests. Lumber and coal cargoes will be moved in these hulls.

* * *

For service as a supply ship for the government schools and stations in Alaska, the brigantine BOXER has arrived at Seattle from Newport, R. I. The BOXER was formerly a government naval training ship. She is being converted into a schooner and will be equipped with a 300-horsepower diesel engine. Accommodations for 12 passengers will be provided and in every way the vessel will be adapted for the peculiar service to which she has been assigned. Returning from the reindeer stations in Alaska, the BOXER will bring reindeer carcasses, cold storage capacity for 1500 being provided.

* * *

Extensions to pier and warehouse buildings to cost $30,000 have been authorized at the Skinner & Eddy ocean terminals in Seattle. This site during the war was occupied by the Skinner & Eddy shipbuilding plant. Since conversion to an ocean terminal, business has increased to such an extent that greater facilities are now required.

* * *

The treasury department announces that Sitka, Alaska, has been made a port of entry. This will be a great convenience to fishing and trading craft which may hereafter enter and clear.

* * *

One of the largest herring plants on the north Pacific is under construction on Protection island, B. C., for Maritime Fisheries, Ltd. It is expected to treat 5000 tons of herring during the 1923 season.

* * *

The supreme court of the state of Washington has decided that the business of stevedoring is under admiralty jurisdiction and is not governed by the state's industrial insurance act as are other extra hazardous industries. This point was determined in a test suit brought to determine whether congress had authority to remove stevedoring from admiralty jurisdiction.

* * *

Because of strike conditions in Australia, the British steamer MAKURA arrived at Vancouver, B. C., recently with a volunteer crew. Vancouver stevedores threatened to strike in defense of the workers in Australia but upon taking a vote they decided to handle the MAKURA as usual and no trouble resulted in the British Columbia port.

* * *

Coasting business between British Columbia and California has grown so rapidly that the Canadian government merchant marine is bringing the steamer CANADIAN VOLUNTEER from the Atlantic to augment the local coastwise fleet.

* * *

Convicted of assault on the high seas Frederick Hansen was sentenced to five years in federal prison by the court at Seattle. Hansen was formerly mate on the barkentine ROLPH.

* * *

The port of Seattle is contemplating the employment of a high class traffic expert to bring additional commerce over Seattle's publicly owned terminals. Among those under consideration are F. H. Burroughs, of the rate committee of the transcontinental freight bureau, now at Chicago, R. D. Pinneo, traffic manager at Astoria and H. L. Hudson holding a similar position at Portland. The salary indicated is $15,000 per year.

* * *

For use in various Pacific trades, the former naval collier CAESAR has been purchased from the government by R. W. Crosby, a Seattle shipowner. The CAESAR achieved her greatest fame in towing the drydock from an Atlantic port to Manila via the Suez canal. She is to be partially rebuilt for general cargo service.

From the South Coast

AWARD of a contract to A. M. Crain & Co. for installation of an Ellis drier at a cost of $133,800 at the municipal grain elevator was authorized in an emergency ordinance adopted by the Norfolk city council. The drier system to be installed will include a dust collecting apparatus and will bring to the city an additional payment on all grain that goes through it. In stressing the importance of the drier, the city manager pointed out that it will eliminate the possibility of grain spoiling in transit after leaving the elevator. Lessees of the elevator intend to operate it under the name of the Norfolk municipal grain elevator.

* * *

The shipping board has begun inventory preparatory to taking over four large army transports at the Norfolk army base, which were recently ordered transferred to the Emergency Fleet corporation by President Harding. They are the AISNE, MARNE, OURCQ and TOURS.

* * *

These transports will be towed to Camp Eustis, and anchored with other idle vessels of the shipping board. Addition of these transports, with 15 vessels recently brought down from Baltimore, will bring the total number of ships now stationed in the James river up to 360.

* * *

Removal of the transports from the army base, where they have been laid up at pier 1, for the past two years, is expected greatly to clear up the situation regarding lease of the pier to the city of Norfolk. For some time past, it has been expected that the government might decide to withhold lease of pier 1, on account of the necessity of retaining berthing room for these four large vessels. Now that it has been definitely decided to tow them to the James river fleet, this difficulty is removed.

* * *

The steamer WYTHEVILLE, which has been anchored on the James river, with the remainder of the inactive fleet, for some months was brought to Hampton Roads in December for an overhauling by the Colonna shipyard with a view to re-entering active service. She has been assigned to the Mallory lines, New York, under a managing agency agreement, and will operate for that company in the East African trade. It is understood that she is also to be fitted up to carry passengers.

* * *

Now 850,000 barrels of oil are stored at Craney island, Hampton Roads, for use of vessels owned or operated by the shipping board. Total capacity of the station, which was built and is owned by the shipping board, is 1,100,000 barrels. According to information received some time ago, the Craney Island tanks are to be used for storage of emergency oil only. In case companies now furnishing bunker oil to shipping board vessels are unable to fill their contracts, this emergency supply will be used to keep ships in operation. At present, shipping board vessels are bunkering oil at the Standard Oil and Texaco piers at Norfolk, contracts having been awarded equally between these two companies.

* * *

Final plans for operating boat lines to points in eastern North Carolina from Norfolk and Baltimore were announced early in January by the Norfolk, Baltimore, Carolina Line, Inc. The new service will begin in January and will afford the best transportation possible to points on the route. One boat, of 200-ton capacity and measuring 125 feet in length with 25-foot beam will be operated on one round trip a week between Norfolk and New Bern. A smaller vessel to be used as a feeder will be operated on three trips each week between New Bern and Morehead City and Beauford. The other service by the line will be operated to Washington, N. C., Belhaven, Greenville and Aurora. A vessel of about the same size as the one to New Bern will be used. Each vessel has been fitted out with new oil engines. The Norfolk terminal will be at 1203 Water street where a warehouse and office is to be maintained. About the first of February, two more vessels, the purchase of which is about to be made, will be placed on the same service only to run on to Baltimore. These vessels will have greater speed and capacity.

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Personal

H. C. CANTELOW, Pacific coast general manager of the Luckenbach Steamship Co., has been elected vice president of the company, the promotion being effective from Dec. 15. Z. T. GEORGE, who has been Mr. Cantelow's assistant, has succeeded the latter as Pacific coast manager. Headquarters of both officials will remain at San Francisco.

* * *

W. D. BENSON, one of the best informed traffic experts on the Pacific coast, has assumed his new duties as secretary of the northern district of the Pacific westbound conference. To accept his new position, Mr. Benson retired as traffic manager for Frank Waterhouse & Co., with whom he had been identified for 22 years. During recent years, Mr. Benson has spent considerable time in New York where he has a wide acquaintance among steamship and railroad men.

* * *

CAPT. W. R. KENNEDY has been appointed Lloyd's representative at San Francisco. For a number of years, he has been Pacific coast agent for Andrew Weir & Co., Glasgow, Scotland.

* * *

I. SUZUKI, son of the famous Japanese woman who is the head of Suzuki & Co., steamship owners, importers and exporters, visited Pacific coast ports recently while enroute home from Europe.

* * *

WILLIAM PIGOTT, Seattle manufacturer, was re-elected president of the Pacific Northwest foreign trade conference recently held at Tacoma, Wash. E. P. Kemmer, Tacoma, was again selected as secretary. J. J. Donovan, lumber manufacturer of Bellingham, Wash., and E. H. Sensenick, Portland, Oreg, were elected vice presidents and Christian Peterson, Portland, treasurer. Hereafter the organization will be known as the Pacific Foreign Trade Council of America. The next meeting will be held at Portland next October.

* * *

OAKLEY WOOD, vice president of the Barber Steamship lines, New York, recently completed a survey of the ports on the north Pacific.

* * *

WILLIAM FOGARTY was named manager of the Smith-Rice Co., San Francisco, early in January. He succeeds Charles Rice, who has been promoted to be vice president and general manager of the company. Capt. James Rice has virtually resigned from active management of the rigging company, and these changes followed. Mr. Fogarty formerly was manager of the San Pedro Launch & Tugboat Co., and is the son of James Fogarty, manager of the marine department of Balfour, Guthrie & Co.

* * *

S. T. DEMILT, agent for the New York & Porto Rico Steamship Co., was re-elected president of the New Orleans Steamship association for the eleventh consecutive term at the recent annual election.

* * *

JAMES C. BARNABY, formerly plant engineer of the Staten Island Shipbuilding Co., Port Richmond, N. Y., has joined the central engineering staff of the Worthington Pump & Machinery Corp., 115 Broadway, New York. While with the Staten Island company, Mr. Barnaby also was in charge of the internal combustion engine work at that plant. He has had 11½ years' experience in ship construction and operation, a service of value in his new position where he will be connected with the company's diesel engine program with special relation to the operation of diesel engines aboard ship.

* * *

E. F. CLARK has been placed in charge of the marine sales department of the Westinghouse Electric & Mfg. Co., New York. Mr. Clark is a member of the Society of Naval Architects and Marine Engineers and also of the Philadelphia Engineers' club.

* * *

W. J. LOVE, general manager of the Emergency Fleet corporation will make his headquarters in New York in charge of the board's operations at 45 Broadway. All lines will report to Mr. Love in order to co-ordinate the shipping board's passenger service. W. B. Keene with title of director of traffic will take over duties relative to traffic formerly performed by Mr. Love.

* * *

WILLIAM CAMPION recently resigned as traffic manager of the British America Tobacco Co. to devote himself exclusively to the Garland Steamship Corp., New York.

Business News for the Marine Trade

Permission has been granted the Marine Transportation & Fuel Co., Los Angeles, to build a new coaling plant on the main channel, Los Angeles harbor. The plant will consist of a bunker with mechanical loading and unloading equipment, lighterage plant with machinery and other mechanical apparatus. It is understood the project will involve the expenditure of approximately $500,000.

Capitalized at $350,000, the Connelly Transportation Co., Buffalo, recently was incorporated to engage in the navigation business. Incorporators of the company are J. and J. M. and W. C. Connelly.

With a capital stock of $300,000 the Oldman-Magee Boiler Works, Buffalo, recently was incorporated by E. W. and S. Oldman and C. D. Magee. The company is represented by T. C. Burke, attorney.

The Merchant Shipbuilding Corp., Chester, Pa., is arranging for the abandonment of operations at its Chester, Pa., yard, and the transfer of all work to the yards of William Cramp & Sons Ship & Engine Building Co., Philadelphia, which is an affiliated organization. Expansion will be carried out at the latter plant to accommodate the combined business. No plans have been made regarding the future utilization of the Merchant yard. R. H. M. Robinson is head of both companies.

Carl Hartman of the Green Bay Dry Dock Co., Green Bay, Wis., is reported planning the construction of a $750,000 drydock at Green Bay. The dock will have 12 concrete sections, 50 x 60 feet, and will be operated in connection with other vessel building interests of Green Bay.

It is understood that the construction of an 800-foot pier as the first unit of a municipal dock system, will be recommended to the Detroit city council by J. A. Martin, commissioner of the department of public works.

Rebuilding of 1700 feet of superstructure of the north breakwater at Ludington, Mich., is proposed and an appropriation of $150,000 for the work has been asked for.

To salvage vessels, the Merritt, Chapman & Scott Corp. recently was incorporated under the laws of Delaware with a capital stock of $11,500,000.

Capital stock of the Moore & McCormack Co., New York, recently was increased from $5000 to $500,000.

With a capital stock of $200,000, the King Boat Works of Highlands, Monmouth county, N. J., recently was incorporated by Stewart B. King, Lester J. King, George C. King and Harry N. Johnson.

The Royal Barge Line Co. recently was incorporated under the laws of Delaware with a capital stock of $750,000.

The Four Oceans Navigation Co., New York, recently was incorporated with a capital stock of $5000 by R. J. Sykes, M. Roger and W. H. Gillon. The company is represented by B. Benynge, 111 Broadway.

Announcement has been made by the H. E. Crook Co., Inc., 28 Light street, Baltimore, to the effect it has taken over under lease the drydocking and ship repair facilities of the Union Shipbuilding Co. The facilities, all of which are new, include a Crandall 10,000-ton electric railway. The additional facilities will be operated in conjunction with the Crook company's present plant at Locust Point, and it will be used primarily for under-water work, enabling the

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Business Changes

DYKE, Shute & Co., weighers and samplers, have moved from 24 India street, Boston, to 152 Milk street.

* * *

The United States lines in Boston have moved from 92 State street to 75 State street in order to have larger quarters.

* * *

T. A. Scott Co., New London, Conn., has merged with Merritt & Chapman Derrick & Wrecking Co., New York. T. A. Scott is president of the new firm which will be known as the Merritt-Chapman & Scott Corp. of New York.

* * *

Nathaniel J. Doane, recently connected with the Doane Tow Boat Co., has incorporated his business and will operate under the name of the Trident Tow Boat Co. at 23 T. wharf, Boston.

* * *

Crawford, Hammond & Co., importers and exporters, have established their own office in New York, located at 4 Hanover square. Frank E. Crawford, formerly with W. R. Grace & Co., is in charge of the New York office.

* * *

The Oxweld Acetylene Co. has moved its western department, of which Leo Romney is manager, from 1077 Mission street to larger quarters at 1050 Mission street, San Francisco. At the new location the company occupies the entire building, two stories and basement, 20 x 150 feet, thus affording better facilities for warehousing welding and cutting apparatus, supplies, acetylene generators, etc., for offices and for an apparatus repair service department such as the company maintains at stations in industrial centers throughout the country. On the Pacific coast and in the Rocky Mountain states, such stations are located at Seattle, San Francisco, Los Angeles and Salt Lake City.

docking of vessels up to 420 feet. An indication of the completeness of the plant is obtained in the company's statement that all construction, repair and installation work will be executed by itself without letting subcontracts.

Weeks-Howe Co., Inc., Seattle, ship chandler, etc., has announced it has taken over the northwest territory for the sale of marine ranges manufactured by the White-Warner Co., Taunton, Mass.

A petition in bankruptcy has been filed against the Astoria Boat Works & Marine Equipment Co., 22 Clay street, Brooklyn, N. Y.

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Advices have been received from the Wisconsin Steel & Dock Co., Milwaukee, to the effect it has taken over the plant of the Milwaukee Marine Repair Co., and will operate it. It is understood this action places the Wisconsin company among the leading companies devoted entirely to marine construction and repair work. J. J. Cato has charge of the mechanical department of the company, while F. W. Stevens is in charge of the hull department.

Capitalized at $20,000 the Atlantic Boat Yard Co., Miami, Fla., recently was incorporated by E. L. Hess, who is president, Van Allen Harris, who is secretary-treasurer, and others.

The Disappearing Propeller Boat Co., Buffalo, is reported planning to establish a distributing plant at Charlotte, N. C. The company manufactures power boats, capacity ranging from seven to nine passengers.

The Pelsang Boat Works, Miami, Fla., has been reorganized with Roy C. Wright as president, Gus Muller Sr., as treasurer, Gus Muller Jr., secretary, and E. S. Thibault, superintendent. The plant will be re-equipped and every department made complete for building boats and installing motors.

The property of the Interstate Coal & Dock Co., Green Bay, Wis., which has been taken over by the Cleveland-Cliffs Iron Co., will be enlarged and used by the Valley Camp Coal Co. The dock stores 250,000 tons of coal, has 18 feet 6 inches of water at dock, handles any length of boat, has a 5-ton clam shell, one bridge, and unloads 3000 tons in 10 hours. The unloading capacity will be increased to 10,000 tons in 10 hours, it is understood.

A plate shop and $50,000 of plate working machinery are to be added to the plant of the Tebo Yacht Basin Co., Brooklyn, N. Y., which is part of the Todd Shipbuilding interests.

The Eastern Steamship Co., incorporated at Ottawa, Ont., has placed orders for 10 steel steamers of canal size to be operated next year between Buffalo, Port Colborne and Montreal. Buffalo grain shipping interests are understood to be behind the company, which will give increased facilities for grain shipment.

Capitalized at $1,500,000 the Charles R. McCormick Steamship Co. recently was incorporated at Sacramento, Cal.

Among recent Delaware incorporations was the Fidello Navigation Co., which was chartered with $50,000 capital stock.

The Hunter Navigation Co. recently was incorporated under the laws of Delaware with a capital stock of $50,000.

The Commonwealth Steamship lines has been incorporated at Portland, Me., for $200,000. H. P. Sweetser is president.

New Trade Publications

SMALL TOOLS—Consolidated Tool Works, Inc., New York, is circulating a 28-page illustrated booklet in which small tools are described and illustrated. These include hacksaws, braces, planes, drills, calipers and dividers, wrenches, tool and tap holders, micrometers, etc.

ELECTRIC CRANES—Whiting Corp., Harvey, Ill., has published a 32-page illustrated booklet containing information on the operation and maintenance of electric cranes. The importance of keeping crane equipment in good repair, etc., is pointed out and how this should be done is outlined in detail. Numerous illustrations and line drawings of the various crane parts supplement the text.

POWER LOSSES—The Uehling Instrument Co., Paterson, N. J., has issued a 12-page folder which concisely explains the two largest losses in the steam power plant, namely the loss in steam turbine economy due to air leakage into the condensing system, and the sensible heat in the flue gases lost up the chimney. A table gives data on steam turbine economy as related to the absolute back pressure. A combined barometer and vacuum recorder, described and illustrated in the folder, acts as an automatic log of condenser performance, recording the existing vacuum as well as the absolute back pressure for every second of the day. The chart is legible to less than 1/20 inch of mercury between the range of 0 and 6 pounds back pressure, thus detecting air leakage into the condenser, exhaust piping or turbine casing, and showing whether or not the condenser is large enough to handle the load under any given conditions. In another table data on combustion are given.

INDUSTRIAL EQUIPMENT—A 16-page illustrated booklet has been published by the International Combustion Engineering Corp., New York, in which a brief description of the company's products is given. These include stokers, pulverized fuel systems, fuel oil burners, coal dryers, ash conveyors, oil torches, etc.

MOTORS—Indestructible rotor, built-in overload capacity, effective system of ventilation, liberal shafts and bearings, and high starting and pull-out torques, as well as excellence in design, etc., are claimed for the motors manufactured by the Louis Allis Co., Milwaukee, in a 16 page illustrated booklet which recently was published. The heavy-duty type of motor is described in the booklet, the various parts of it being described and illustrated in detail.

STEAM TURBINES—The DeLaval Steam Turbine Co., Trenton, N. J., has published a 24-page illustrated booklet in which the plant and products of the company are described and illustrated. The products of the company include steam turbines, turboalternators, centrifugal pumps, centrifugal blowers and compressors and double helical gears.

WELDING AND CUTTING APPARATUS—The Alexander Milburn Co., Baltimore, has published a small 24-page illustrated booklet in which welding and cutting apparatus is described and illustrated. This apparatus includes acetylene generators, portable oxy-acetylene plants, torches, regulators, and other accessories.

CONDENSER TUBES—Research work in industry is coming into its own, particularly along lines of chemical engineering. The Chase Metal Works, Waterbury, Conn., has recently issued an attractive 31-page pamphlet describing its methods of manufacture. A large part of the publication is devoted to processes of research and scientific investigation leading to the choice of proper percentages of the metals to go into an alloy which will best resist the destructive corrosive conditions under which condenser tubes are used. The interesting question of grain size, coarse, fine or medium, in its effect on resistance to corrosion and the processes involved in obtaining gradations in grain are treated in an impartial and detached manner. Recommendations based on thorough study and long experience are given as a basis for securing best results in condenser tubes. The knowledge, experience and services of the research department and laboratory of the Chase Metal Works is freely drawn upon to make the pamphlet of value to users of condenser tubes.

SUPERHEATERS—The Power Specialty Co., 111 Broadway, New York, has recently issued a catalog on its superheaters. The catalog is especially well prepared, with many good illustrations of ships fitted with this type of waste-heat superheater. Drawings and illustrations of typical installations, with tables of test records and a partial list of ships fitted are given. Altogether it is an interesting and useful pamphlet.

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